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A Western Air Express Fokker F-10 over the San Bernardino Mountains, Southern California

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The Oldest American Aeronautical Magazine

Vol. XLV

SEPTEMBER 1, 1928

No. 10

Happy Landings, Los Angeles

ONE week hence marks the beginning of what one might term as the greatest aeronautical show ever held in the history of the industry in this country and perhaps in the entire world. It is known as the 212th National Air Races and Aeronautical Exposition and will take place at Mines Field, near Los Angeles, Calif. There have been National Air Races held before and there have been several aeronautical expositions held in times past, but Los Angeles and the California Air Race Association have seen fit to combine the two in one great gala event.

The California Air Race Association has before it a task which is no easy one to accomplish. For years the National Air Races were a financial failure, but in the fall of 1927, Spokane, Wash., put the record over with a bang. Spokane not only won the admiration and praise of the industry for the efficient way in which it conducted that week of aeronautical activity, but it also surprised the industry by making a goodly profit on its endeavors. In April of this year the Detroit Board of Trade put on the All American Aircraft Show. Although that affair is now history the industry is still talking about the almost unbelievable success that was attained.

And now Los Angeles, under the guidance of the California Air Race Association, is endeavoring to make a success of a double program. It desires presentation to be taken to an exhibition of the final result, then it would seem as though Los Angeles would be covered with success. According to our Los Angeles correspondent the California Air Race Association, composed of men well known throughout the industry for their ability to do things, has left no stone unturned which would add in any way to the attractiveness and interest of the days and nights in Los Angeles between September 8 and September 16.

It is stated that over 1,000 planes and some 4,000 pilots and their mechanics will converge at Mines Field and near by fields during that week to take part in a well-arranged program that includes several events from O.N.T. international and non-theory events. It has also been stated that over 150 plane, engine, accessory and equipment manufacturers will display their products in Exposition Hall. In addition there are to be held, during the week, several technical meetings and trade conventions as well as many other gatherings which will be more of a social nature.

That this great aeronautical event will be a success as regards spectators, is a foregone conclusion. That it will be a financial success is a matter for speculation. However, we feel that Los Angeles will not let it over the Spokane and Detroit, and in the mean time we wish that attended city the best of luck and happy landings.

Airplane Manufacturers

VARIOUS newspapers have played up in a large way the fact that there are more than twice as many airplane factories as there are automobile factories. The reference has been that the airplane industry is as large or nearly as large as the automobile industry. As a general it might be well to cite the fact that there are many more people manufacturing airplanes in the United States to-day than there were ten years ago, but this does not necessarily prove that the figure is greater than it used to be. It might be well to point out also that there were many more automobile factories ten years ago than there are now, yet the automobile business has greatly increased.

However, unless the airplane industry changes very radically in its fundamental characteristics during the next few years there will probably continue to be more airplane factories than there are automobile factories. Automobiles change so much more rapidly and themselves easily to production because one chassis can be used for bodies which will fit from two to seven people. In airplanes, every new one wishes to change the number of passengers which the plane will carry, one will have to change the design entirely. As the power for a two-seater single all the way from twenty to four hundred horse-power one can easily see that it will be hard to standardize type and reach really large production. Also, under the present conditions it takes very little equipment to build a plane, and still the investment in machinery becomes very large. It will mean that almost any bright engineer and energetic business man can start building planes. Between the variation in the fact to be carried and the variation of the power which can be used to carry that load, there are an almost infinite number of different possible types of planes. So long as this is so it will be harder to reach production and that will mean a large number of planes manufactured.

In the matter of engines the situation is quite different. In the first place it takes a great capital investment to start building engines and in the second place there are a limited number of possible sizes which would be necessary. For example, a four headed, horse-power engine will do for a high power two-seater or a commercial seater or any of the intermediary possibilities. It would also be suitable for a multi-engine plane. By changing the number of cylinders many of the parts remain the same, but the power range is changed. For these reasons there will probably be only a small number of engine manufacturers, but they will be in large production. In the building of airplanes, many of the parts which become standardized and are built in large numbers, those will probably be a considerable number of subcontractors with a comparatively small production.

Clubs and Schools in Southern California

By CHARLES F. McREYNOLDS

Airport Representative, Los Angeles, Calif.

WITHIN the seven counties which comprise Southern California actually in operation, and a very considerable estimate places the number of private students now engaged in flight training at something more than 600. These are at least 300 private students now training in the immediate vicinity of Los Angeles.

Government flying activities, notably the work at March Field, Riverside, where from 300 to 350 cadets are now regularly under instruction, easily brings the total number of flying students in the Southern California district to 1000 or more. This is probably a far more intensive concentration of students at the art of flying than could be found at the present time within any like area in the country.

Much of the popularity of this locality as a place in which to learn to fly is no doubt due to publicity given to activities of the primary training school at March Field. These cadets, with a total of 125 airplanes at their disposal, are flying daily over a wide area and impressing thousands of young men with the desirability of such training.

On the other hand it is not likely that there are anywhere so many well organized and completed private flying schools in operation in our locality as the prospective student may assume from here. Courses of instruction,

can obtain an airplane, secure the services of a reputable transport pilot as instructor, and successfully operate in a territory where several schools are engaged in instructing as many as 100 students at a time.

There are a number of clubs operating in the smaller towns such as: Balboa Field and Balboa Club, San Diego; Calexico Flying Club, Calexico; the Indio Coor-



A line up of planes of the Aero Corporation of California

ds Flying Club, Coachella Valley; and the Compton Flying Club, Compton, but even these in most cases make use of established school facilities.

The Western Aero Club, Hollywood, and the Eagle Aero Club, Los Angeles, have been quite active, the latter organization specializing in low class five private pilots who are trying to obtain the required number of hours for their limited commercial or transport pilots license.

The only Los Angeles flying club that has made real progress independently of any flying school is the Lindero Club founded by Louis Lewis De Jean, formerly of the Canadian Air Service (and now National Secretary of the Allied Pilots Association). There are more than one hundred young men now enrolled in the Lindero club. Activities have been divided into Pilot, Engineer, Design, Navigation, and Business groups with a good representative in each. Flight training is given by special arrangement with an established school. Club headquarters have been opened at 2823 South Robert Boulevard, Los Angeles, and all visiting pilots to the National Air Races are invited to call. Mrs. C. A. Tresh will act as hostess. She is widely known as the "Mother" of war time fliers and has always kept open house for pilots.

The Los Angeles Clubhouse of the Lindero Club is known as Hanger Number Two, Hanger Number One being located at the original clubhouse in Culdado. Other hangars are planned for towns throughout Southern

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Airport Development in Oregon

By JOHN W. ANDERSON

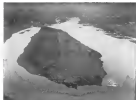
Airport Representative, Portland, Ore.

OREGON has submitted its bid for recognition as one of the most air-minded States of the country, basing its claim on the comparison between these two figures:

Number of airports to be in use by January 1, 1929—58
Number of incorporated municipalities, as listed in the Oregon Blue Book—290.

Most of this development has come about in the past two years. Medford, now an important stop on both the Pacific coast air mail and the Seattle-Sea Francisco air passenger line, and Eugene are the two cities which prospered in the airport field. A few other cities had fields used occasionally by transient pilots, but all of the rest of the airport construction has come in a spurt, to catch up—or forge ahead, if possible. Even Portland, the largest city in the State, lacked no municipal field until a year ago.

Oregon's interest in aviation, as in most States, was maintained for several years solely by barnstorming fliers, with some assistance on the part of Army pilots on forest fire patrol duty. Two or three flying schools sprang up, notably that of J. G. "Doc" Kautler, in Portland, now the Eastern Flying Service, Oregon's best known aviation institution, founded in 1922. Other as a whole looked on



Air view of Seas Island, the Port of Portland airport, taken before the construction of hangars had been started.

airplanes as curiosities, but not in any way connected with community development.

In 1924 probably the biggest single influence in aeronautical growth in the State took a hand. The State Department of American Legion adopted a policy of air-

port promotion. George Love of Eugene, was time far and post-war barnstormer, played a big part in this stage of the game. He was most champion of aviation at that year and was largely responsible for the authority of the State Department's policy. In fact, as a delegate to the



National Air Tour planes at Barker Field, Medford. This field is at present a Pacific Air Transport and West Coast Air Transport stop.

National Convention of 1924, in wrote most of the National Legion's campaign declaration regarding aviation. Since 1924 the Legion has been constantly riding such airports into the ears of municipal governments. In many instances the veteran organizations brand their own airports, later getting the cities to take them over. Members of these posts have gone out barbeques and holidays to grade fields, build runways and set up hangars.

Next came the air mail—first, the Pacific Air Transport line north and south along the coast, then the Varney line from Passaic, Wash., to Salt Lake City, cutting across the northeast corner of Oregon and with the continuous presence of western aviation through the Columbia George to Portland.

The gathering of the barnstormers, the forest patrols, the Legion and the air mail did its work well. The Oregon public was practically ready to be convinced. The tremendous events in aeronautics of the past two years fruited the primary education. Colonel Leavelle's eastern tour, the Spokane air races, the arrival of regular air passenger lines and this year's National Air Tour would soon to have thoroughly persuaded Oregon that flying is a real industry crash to be desired.

So this year the American Legion propounded this motto: "We support for every year this year!" It will fall short of its goal, for there are 92 points in the State, but it is making great progress.

Portland is a fair example of this development. A year

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A typical day scene at the Western College of Aeronautics, showing flying equipment, and instruction materials have all been studied and the would be flier tries with state confidence to any one of a great number of very well known flying organizations. So well are the established flying schools conducted that the flying clubs as popular in many parts of the country are relatively insignificant in the territory close to Los Angeles. It is believed that no flying club

Airports in the State of Washington

By THOMAS D. STIMMONS

For Chairman, Aviation Committee, Senate, Chamber of Commerce and Governor for the State of Washington of the U. S. A.

WHEN on Thursday, July 26, 1938, Boeing Field, 20 min. distant by automobile from the heart of Seattle's business district, was dedicated before a crowd of more than 30,000 persons, that city took its place as the nation's air wing.

Comprising 563 acres, with a runway now 2,800 ft. in length, Boeing Field represents an investment of \$500,000 by King County, Washington, in the land alone. King County has subscribed \$40,000 for preliminary construction and development. It is conservatively estimated that expenditures on the airport's development from all sources within the next two or three years will exceed \$1,000,000.

Inception of the movement to obtain a fitting commercial airport for Seattle came from the Aviation Committee of Seattle's Chamber of Commerce. This committee decided in the summer of 1927 that a site must be obtained. A sub-committee was appointed. A score of fields were surveyed. The one now in use was selected as best suited to all needs. It was recommended to commissioners of King County. They adopted it, and agreed as emergency bond issue of \$500,000 for its acquisition.

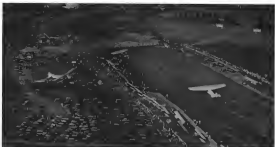
As soon as condemnation and purchase had proceeded

far enough, development was begun. The dedication on July 26 resulted. The acquisition and development did not come as easily and swiftly as this is written. Many serious obstacles and difficulties arose, but the Chamber of Commerce committee stuck to its task. It carried forward its purpose, to create the main issue—an airport.

The new, Boeing Field, was an almost spontaneous and unaided choice, honoring William B. Boeing of Seattle, head of the Boeing Airplane Co., one of the outstanding manufacturers of aircraft in the United States, and at present operator of the nearest route between Los Angeles and Chicago, the longest air mail route in the world.

King County will be responsible for maintenance of Boeing Field. It will be under municipal management. King County will build the runways and administration buildings, fill in portions of the land where necessary, put in the drainage and lighting systems. The different companies using the airport will build their own hangars. Companies will be let to individuals for machine shops, repair shops, etc.

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Aerial view of the dedication of Boeing Field, July 26, 1937 showing one end of the temporary 2,800 ft. runway, visiting planes and two Boeing 12 passenger biplanes. U. S. Army Photo, Wash.

Airline Progress on the Pacific Coast

By D. R. LANE

Aviation Correspondent, San Francisco, Calif.

IN the West was developed the first unestablished profit-making airline the world ever saw, the first airplane to fly over 3,000 mi. without a stop, the first contract air mail route to make money, and, more recently, the longest single company air mail route in the country, San Francisco-Chicago, 1939 miles. Here is a line that was conceived by western men, financed with western money, is operated from a Pacific coast office, that stretches away two thousand miles outward, paralleling to some extent the busy express and stage routes opened west from points on the Missouri river nearly 70 yrs. ago.

On March 1, 1925 Claude Ryan, B. P. Mahoney and J. D. Alexander began operation of a passenger airline which, without subsidy or mail contract, threaded a path for every day it was run. This was something that never had been accomplished anywhere else in the world, for while European lines were flying planes beside which the little California concern's rebuilt Standards were as jack-pots compared to racing steeds, these operations were conducted under safety. These three men went out bare-handed and accomplished the thing for which highly paid executives had been striving and of which every war-time pilot had been dreaming.

The story goes back to late in 1924 when Ryan, a war-time pilot who had been flying forest patrol, arrived

Mr. Alexander used to be an automobile dealer in Los Angeles. He left that field because he foresaw the greatness of the possibilities of aviation.

These three went to dinner one night.

"The subject of an air line came up," says Alexander, then Mahoney as co-pilot of the matter of who raised it, "and we agreed that a line from San Diego, looking that



A Douglas Mail plane from Western Air Transport.

city with Los Angeles, would be a paying proposition. At that time transportation money did not come out San Diego. It was in a sort of a transportation backwater. Yet it was a place of interest to sightseers and tourists and we figured a line that would take them down and back, Los Angeles to San Diego and return, all in the same day, would make money.

"Mahoney put up most of the capital. We got a couple of Standards, took off the wings and tail-sections, built cabin, fuselages and painted the Standards surfaces into this."

They called this combination the "Ryan-Hyman Standard Cabin plane." It flew. With the two aircraft they began a round trip service, out of Los Angeles at 9 A. M., out of San Diego at 4 P. M., one hour on the way, \$17.50 fare each way, \$25.00 for the round trip.

To cover terminal expense they operated flying clubs in both cities with night-coasting trips and taxi service. One of these fields, in Los Angeles, later was taken over by Pacific Air Transport and still is used as the southern terminus of that line.

This operation continued two years, gradually increasing its equipment and personnel until the Ryan airplane factory, an outgrowth of the transportation line, absorbed the interests of its executives. Complete figures of the operation are not available, but for nine months the distance flown exceeded 233,000 mi. and the passengers carried, including short flights, aggregated more than 16,000.

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A Boeing mail plane from Pacific Air Transport

in San Diego and "opened an airport" at the foot of Broadway. There, with antiquated war-time equipment, he began carrying passengers, training students and doing other things. Entered now Mahoney, the man with money, and enrolled himself as a student under Hyman.

Enter, too, the man with an idea—Alexander

Regarding Airports in California

By ANDREW R. BOONE
Aviation Representative, San Diego, Calif.

OVER hundred and thirty-six landing fields of various classifications and characters dot California. Some of these, naturally, are temporary but serviceable, while others offer little as fine facilities as may be found anywhere. The landing field or airport problem in California is considered solved by those who attempt to lead in aeronautical development within the state.

Development of airports, and particularly municipal airports, has taken place largely within the last four years, or since the aviation department of the California Development Association was inaugurated. The C. D. A. is a statewide chamber of commerce. Its aviation policy with reference to airports involves a series of municipal airports, which, as defined by R. E. Fisher, chairman of the Association's aviation committee, "are complete facilities, owned and operated by municipalities."

Four years ago the Army published an airplane map which indicated California's facilities. At that time there were only four municipally owned airports in California. These were located at Yuba in far northern California, Modesto in central California and Bantow and Long Beach in the south. These were considered good airports then, and since that time Long Beach has greatly improved its port. Prior to 1934 many of the fields listed on the Army map had been used by Army and Navy planes, but few by businessmen and other individual firms.

Frank McKee, director of the Association's aviation department, is the individual who has directed municipal

airport development in California. The municipal airport has been the Association's main plank in its aviation platform. It is the Association's point of view—and this coincides with many such experiments—that communities should develop airports in the same way they have paved



Complete picture of Lindbergh Field, San Diego, dedicated August 15 and now under construction.

their streets, as a public property operated for the common good. Through five regional councils Fisher has sent this message to all communities. Each council studied the map of its district and when it became apparent that serious objection existed airports, the committee started its program of selling the idea to those of that section who might see the need for the same. In that, local chambers of commerce assisted materially.

As a result of this work one may now fly either the coast or inland route from the northern to the southern boundary of California and find municipal airports at regular spaced and frequent intervals. Indeed, for instance, one may start from Yuba and land at Montague, Red Bluff, Chico, Marysville, Sacramento, Stockton, Modesto, Fresno, Visalia, Tulare, Bakersfield and Bantow before reaching Los Angeles along this route. At each of these places he may land on a municipal port. It is interesting to note here that at Salinas and Selma the airports are operated by American Legion posts.

There is an immediate intense activity throughout the state toward construction and improvement of airports. Santa Rosa, 50 mi north of San Francisco, recently com-

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An air "shot" of a section of Miller Field, the San Francisco airport.

The Aviation Industry in the West

By A. R. Wild

OFFICIAL records of the Department of Commerce show 140 manufacturers of planes in the United States. The West claims 22 of these. These same records name 36 American engine builders. Eight of these are in the West. Thirteen are 24 air mail routes in operation. Five of them operate solely in the West. One of these, founded by western capital and operated by western men down the western coastlines, is in the West with the East. There are 4,314 privately owned planes in operation in the United States. A western state, California, has 539 of them, almost twice as many as the next state on the list, New York.

Very largely, these days are developments of the past two years. Almost entirely, they are developments of the past three years. Five years ago, there were but two airplane factories worthy of special note in the entire western part of the United States—the Boeing Airplane Co., of Seattle, Wash., and the Douglas Co., of Santa Monica, Calif. The Douglas concern was not an affair of great magnitude, although it was growing rapidly. Both companies were largely occupied with governmental production, as they are today. Here and there, however, some were experimenting with this and that type of plane; but as a whole, the industry was not receiving a great amount of favorable attention from the public.

When President Coolidge signed the bill, which generated lasting controversy for air transportation of mail, commercial aviation in the West might be said to be as

directly, was of far greater benefit than the comparatively small number of actual sales made to the mail contractors. When air mail letters, special stamps and emergency representations of public solvency finally brought the public to the realization that there were such words as "airplane" and "aviation" in the English language, along came Lindbergh's spectacular flight across the Atlantic, which hence-



A Bach "Air Yacht" powered with three 100 hp. Kinner K-5 engines.

mored have a thing the pilots long had known, that aviation was a practical thing.

By Jan. 1, 1927, Douglas' original six employees had grown to 800, and the Boeing staff had been increased to 600. Most of other commercial airplane factories also had sprung up in the West. Ryan, Stearns, International, Kinner, Waterhouse, Breese and Engstrom had become common names in letters and words of aircraft up and down the Pacific coast. These names were representatives of the planes, which were being produced in western factories.

A few months later, there was talk of an all-steel plane, piloted by a man named Thaden (in San Francisco, Calif.), and of a laminated wood plane proposed by Alton Longhead, a wealthy ranchman of Santa Monica. In addition to this, the Boeing company had initiated the contract for a transcontinental mail service, and was building practically his first commercial planes.

The western, now known as the Motozoy-Ryan Aircraft Corp., had developed to a point where it was a considerable business, not only in Pacific coast waters, but in the aircraft markets of the country generally. The Ryan Airplane and Motor Corp. had gotten far enough into production to be attracting attention wherever light

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Francis Brown, in front of a Ryan Stearns manufactured by Motozoy-Ryan Aircraft Co., Inc.

available industry. It was considered, for the most part, by men of small capital—although others of great faith and high ideals. The common item had to have done, which naturally stimulated production. Just more important, their enthusiasm caused the development of a general public interest in aviation, a thing, which in-

Insurance Underwriters and Aeronautics

By HORATIO BARBER
President, Barber & Babson, Inc.
Aviation Underwriters

COMMERCIAL aviation demands adequate insurance protection and, despite any statements to the contrary, full insurance protection has been available since the year 1912 and at steadily decreasing rates of premium—rates which, for some two years past, have compared favorably with rates for some classes of automobile insurance.

The task of supplying adequate insurance protection, in the face of the extremely high catastrophe losses of industry required, and the absence of sufficient volume or "spread" over which to average the risks, has not been a light one. In 1919 and again in 1922 the whole delicate fabric of reinsurance and retrocession, upon which such business is necessarily founded, was threatened with disaster, the result of inexperienced underwriting and unethical practices by its good intentions but irresponsible of successful operation. The millions of dollars lost thus by the insurers would have been better spent in supporting the sounder forces of aviation enterprise rather than in saving enterprises doomed to failure, and in setting up a system of premium rates and policy conditions impossible to administer, thereby causing various excellent aviation enterprises to base their operations on an unsound financial foundation which, when it collapsed, resulted in general confusion and financial trouble. It is to be hoped that history will not repeat itself in that way.

Commercial aviation needs and possesses at present a permanent and reliable supply of insurance protection. Should that be disallowed, as has happened in the past, then the features of permanence and reliability upon which the developers of commercial aviation rely in arranging their financial and operating structure will be affected adversely or destroyed, and it might then be found extremely difficult, and perhaps impossible, for a long time to reconstruct them.

Started 16 Years Ago

I have been asked to discuss upon my work as an aviation underwriter, which I commenced in the year 1912 and since I was not addressing insurance men versus the peculiar language of insurance, I think I can describe my work best by employing the medium of an analogy.

I was at one time a designer, builder and pilot of aircraft and also the captain of a small aerial fleet. I was interested with the experience, problems, difficulties, troubles and joys of the most interesting phase in the world, and all aircraft pilots, mechanics, designers, manufacturers and operators were my brothers, and so I signed them now and forevermore.

Since those carefree and inspiring years of practical operation, the goals have been set to build up with larger possibilities and greater risks as commensurate of a far

wider field comprising thousands of craft. Those craft are policies of insurance. They are captured by pilots of my direct control and upon whom I must rely to follow their sailing directions as specified in the pilots' papers known in this current game as the Schedule of Warrantage.

Each ship carries a certain quota of risks for which I am responsible up to, and very often over, \$100,000 a ship. I am responsible to my clients, the presidents of the various insurance companies whose fleet of policy ships I command, and at the same time, I am under the strongest sort of moral responsibility to the aircraft operators carrying cargo (risks) carried on my ships. I have to follow first sailing orders of the most complicated sort and involving opposing principles which must be balanced to a nicety if my fleet is to prosper. Here are some of them and I warrant that no one will envy me their interpretation and execution.

No Excessive Premium Profits

I must not make excessive profits in freightage (premiums) paid for the carriage of cargo (risks) over and above losses paid, or I shall be the object of criticism to the companies as stated above, I must not accept for compensation my fleet. On the other hand, I must not make a loss for the owners (the insurance companies) of my fleet or they will withdraw it from commission, and then everyone, including myself, will be on the rocks.

I must satisfy the consignors by carrying on the ships of my fleet risks hazardous in the degree that they represent greater progress with all the unknown factors and perils natural to a pioneer development. While satisfying the consignors as stated above, I must not accept for carriage on my ships risks of an excessively hazardous nature or the consignee issues will result in higher freightage rates (premiums) and also losses to the ship-owners who employ me, in which case the consignors (aircraft operators) will black-guard the ship-owners (insurance companies). I shall be the scapegoat, and my fleet and all it moves to the commercial development of aviation will cease to prosper.

Again, I must interpret my fleet sailing orders not in the light of any book of rules nor in the light of past scientific experience (since such past experience is only misleading in the face of rapid development and constantly changing conditions). But in the light of a swift sense, compounded of such diverse elements as a progressive spirit, extreme caution, broad outlook, precision in details, and mastery with such opposite factors as flying experience, a detailed outlook, legal knowledge, quick decision and practical execution.

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The Boeing Model 80

New 12-Passenger Transport Powered with Three "Hornet" Engines Has a High Speed of 128 M. P. H.

THE Boeing Model 80 tri-engine transport airplane, recently completed by the Boeing Airplane Co., of Seattle, Wash., is set to be the largest airplane ever built for quantity production on the Pacific Coast. The first plane has been tested and several more are soon to be completed for use on the air route line between Chicago and San Francisco operated by Boeing Air Transport, Inc. Three Pratt & Whitney "Hornet" engines each developing 525 hp at 1,900 r.p.m. will comprise the stock power plant.

The Boeing Model 80 may be considered a two bay design with the wing engines mounted in the lower airplane strut spaces. It has an upper wing span of 80 ft., an overall length of 55 ft., and an overall height of 14 ft., 8 in. The weight of the plane empty is 9,229 lb. and the gross weight fully loaded is 15,254 lb. The actual payload is 3,652 lb., which provides ample capacity for mail, baggage and express in addition to the 12 passengers the plane is designed to carry.

A number of tests conducted recently showed the plane to possess remarkable flying characteristics for its size. With full load it has a high speed of 138 m.p.h., a landing speed of 55 mph and takes off in 12 sec. with a run of 635 ft. The climb rate is 700 ft. per min. and the service ceiling 14,300 ft.

The wings are retractable in plan form and have ailerons and ribs of duralumin and fabric covering. The Boeing N-22 airfoil section is used. Ailerons are of the Frise type, differentially controlled. Control plane struts are inclined and duralumin are also used in the forward wing. Welded steel tubes are used in the construction of the fuselage, which is also covered with fabric. The cabin is built into the fuselage and entered through a door on the left side.

Nothing contributing to the comfort of passengers and pilots has been omitted in the accommodations provided in this plane. The spacious passenger's cabin is 48 ft.

long, 5 ft., 3 1/2 in. wide and 6 ft., 1 1/2 in. high, affording sufficient headroom for passage of ordinary stature. Seats are arranged in four rows of three each with double seats on the left and single seats on the right of the aisle running aisle. These seats are provided with springs and



A rear view of the cabin of the Boeing 80 showing the 12 seats, lights and panel seats.

upholstered with leather and have reclining backs adjustable in four positions.

No structural members obstruct the view from the large windows of non-obstructible glass which can be partially or completely opened. Forced ventilation and heating is provided for the cabin, which is insulated and sound proof. Illumination at night is afforded by two direct lights and standard wall lamps provided with individual switches are installed opposite each row of seats. (Continued on page 736)



A front quarter view of the Boeing Model 80 powered with three "Hornet" engines.

Numerous Fields In L. A. County

Total is 48 With Mines Rare
Site of 640 Acres
Largest

LOS ANGELES, CALIF.—A recent survey by the Regional Planning Commission of Los Angeles County has revealed that there are 48 airports and landing fields actually in operation within the county. These flying fields vary in size and importance from Moses Field, one of the National Air Bases, down to a number of private or family fields that are used chiefly for sport flying.

The survey was undertaken by the commission in order that future flying plans might not interfere with established airports. A report was also made on all areas which were designated to be of value for the future establishment of airports and these areas will be purchased until a complete airport program can be worked out.

The commission also included in its report valuable data on available horsepower and corresponding landing fields, both now being used where new flights are made or maintained, and those which are not being used.

It is thought that Los Angeles City and County together will employ the data.

Union Gets Living Quarters

LOS ANGELES, CALIF.—Six new living quarters were recently purchased by the Union Oil Co. from the Aero Corporation at Calico, Los Angeles district for the Irving workers.



Men at work in the factory department of the Lockheed Aircraft Co., factory at Burbank, Calif. An acquaintance with the method of construction of the newly produced Lockheed motorless fighters is afforded by the view of partly completed plane in the foreground.

Oiling of Mines Field Arranged

LOS ANGELES, CALIF.—Expanses of the Union Oil Co. and the Standard Oil Co. have arranged with the National Air Bases that all oil refineries that will be abandoned from Moses Field and neighboring traffic centers prior to the air routes.

Following grading of the new runway extension to handle traffic to and from the field and after the field itself is smoothed off, the two oil companies will dispatch crews equipped with tank trucks containing many thousands of gallons of special dirt laying oil for the treatment of all necessary areas.

New Plant to Increase Lockheed Production

BURBANK, CALIF.—The new Lockheed Aircraft factory at Burbank, Calif. with 200,000 sq. ft. of floor space and a personnel of over 100 skilled employees is now in final production up to eight planes per month. Three new factory units have recently been completed and are now in full operation. The order of the Harry Steel Aircraft Corp., Los Angeles, for the new Vought aircraft is being the Lockheed factory floor day and night.

According to Ray Blanton, Lockheed official, it has been necessary to turn away many requests for specially constructed addition plans wanted for training flights and similar purposes. Such work must interfere with the scheduled production of military types, and while the Lockheed factory is up to the demand for the new types all efforts must be concentrated on an uninterrupted production line.

Steele Names National Air Race Champions

LOS ANGELES, CALIF.—Dudley M. Steele, current chairman of the National Air Bases has announced a contest among pilots and group organizations which will have charge of all arrangements in connection with the various races being held in Los Angeles.

Personal of the second championship announced by Steele is: John J. Fisher, Earl Daugherty, Maurice Murphy, E. J. Pickett, Maxwell P. Gossard, Paul W. Pickett, Fred C. Widling, Major C. C. Moore, Wilbur Henry, Capt. Walter P. Pennington, C. B. Pickett, Capt. J. C. Lester, Dr. Isaac H. Jones, Maj. A. K. Ward, Sherman, Walter Whitman, E. M. Lewis, V. E. Barrows, T. S. Langdon, Maj. B. Gossard, Don E. Smith, Lenz, E. J. Kopp, Capt. M. G. Gossard, W. E. Thomas, Jack Pickett, Capt. J. C. Lester, George S. Woodard, Capt. Ralph M. De Rose, Earl Gossard, Lenz E. T. McKenna and C. J. Kipp.

Thinks Has New Phase

OAKLAND, CALIF.—Designed and built by H. V. Thulin of San Francisco on the model of his original air racing monoplane, the Thulin is a new type of all metal monoplane being developed at the Oakland airport for use as a day fighter. It is a full performance plane, powered with a Wright Whirlwind engine and is made entirely of aluminum. The wing span is 40 ft.

The features of the plane's construction, it is said, is based on a view which was dropped completely to increase resistance when landing. The Thulin has a low wing, a high tail, and a high fuselage. The maximum high speed is 140 m.p.h. and the maximum altitude is 40,000 ft. The Thulin is now in the final stages of construction.

Permit Movie Stars to Fly

HOLLYWOOD, CALIF.—Permit has been granted to all famous players under contract with the Motion Picture Rights and similar purposes. Such work must interfere with the scheduled production of military types, and while the Lockheed factory is up to the demand for the new types all efforts must be concentrated on an uninterrupted production line.

Hollywood studios have refused to permit stars to make use of aerial transportation due to the supposed risk involved. With this belief dispelled by new studies which undoubtedly be of great benefit in promoting air passenger travel as the planes are shown continuously in their refinements for the use of transportation.

Spokane Firms in New Office

SPOKANE, WASH.—Deputies of the Spokane Airways, Inc., was opened at 1000 First Street recently. Previously all business of the company had been conducted from the headquarters office, which will now be a division where the general office will be given status.

AVIATION
September 3, 1939

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New York-Los Angeles Route Maps Available

WASHINGTON, D. C.—A new map showing the New York to Los Angeles via the National Air Bases and the National Air Bases, was now available at the National Bureau of the Department of Commerce with the sanction of the branch from Port Worth to 100 ft. on Atlantic, Midland, and Pease. For the stretch the American Express company has the right to fly the route. The map available and the routes they cover follow: New York to Harlingen, on May 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

The maps can be obtained from the American Express Company, 1000 Broadway, New York, N. Y. at \$1.00 each. Payment must be made by postal money order, certified check, or cash, as delivery check and change will be required.

Plans Aero School at Washington University

SEATTLE, WASH.—M. Lyle Spencer, president of the University of Washington, has announced his plan to establish a new school of aviation before the Washington State Legislature proposed plans for the establishment of a school of aeronautics at the University of Washington which would be the first of its kind in any of the large American educational institutions and which is expected to be the first.

The university has a nucleus for the establishment of such a school in the Graduate division of 100,000 sq. ft. of space in the building on the campus as soon as the state legislature appropriates money for the building and the school is established. Dr. Spencer pointed out that the legislature will meet in January.

High Selen Through Aviation

MINNEAPOLIS, MINN.—During a recent sales campaign, Edwards, Inc., of the city, offered as prizes in their salesmen 1000 in the competition opened and sponsored by the Minneapolis Sales & Travel Co. of Minneapolis. Although the contest was to last a month, the prize was reached within two weeks and the salesmen were awarded 20 per cent. Due to the immediate success the salesmen were awarded 1000 in the competition opened and sponsored by the Minneapolis Sales & Travel Co. of Minneapolis. Although the contest was to last a month, the prize was reached within two weeks and the salesmen were awarded 20 per cent. Due to the immediate success the salesmen were awarded 1000 in the competition opened and sponsored by the Minneapolis Sales & Travel Co. of Minneapolis. Although the contest was to last a month, the prize was reached within two weeks and the salesmen were awarded 20 per cent. 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Brownsville, Tex. Building Airport

*Construction Work is Started
After City Peter Bond
Issue of \$100,000*

BROWNVILLE, TEX.—The City of Brownsville has voted a bond issue of \$100,000 to build an airport on some water outside the city. The field is a level area of about 900 acres, of which 200 acres will be used at the present time. It is situated on a narrow highway, about 200 feet from town.

The main portion of the field is a rectangle, 1000 feet wide, by 4000 ft. long, north and south, and extends nearly a mile diagonally to the southeast of the field. The portion is now being leveled off, and will shortly be suitable for building. It is planned to use the surface leveling, to provide good landing for all seasons. An additional 40 acres on the southeast portion for an end and west runway of 4000 ft.

Building Main Hangar

On the west side of the field are to be built a hangar and an administration building. The hangar, costing about \$75,000, is constructed by the International Harvester & Equipment Co. of Columbia, Ill., and is 90 ft. by 100 ft. all-steel, with a concrete floor, and a lean-to for pumps and storage work. It is long by 3 ft. wide. Building will be built and not erected for at least 15 ft. high, and 20 ft. in, with, or larger enough to take the largest new machine.

The administration building is being constructed by Proctor & Duffley, local contractors, at a cost of approximately \$25,000. The building will have offices, storage, pilot's room, and first aid room. A shower room inside directly with the building, and rest rooms, and a room for both men and women. Two small offices are also provided for operators and ground crew. A 10 ft. by 10 ft. room at the end will house the chauffeur and control room. The whole building will be of the all-steel frame, in a modified Spanish architecture.

G. E. to Provide Lighting

Contract has been signed by Mayor Cook and the City Commissioners with the General Electric Co. for complete night illumination, including two airport floodlights, revolving beacons, boundary and center lights, and show lights with one pole mounted lights for completely illuminated path, for about \$12,000.

It is expected that this field will become one of the best constructed, owned and operated fields in the Southwest. This has been accepted for an air mail route to come from New Orleans to either Laredo or Brownsville and then to San Antonio. The route was started on the field, across the plain located in Brownsville bordering the Mexican. This field route will be the

Use of Air Mail Brings Results

JACKSON, MISS.—Postmaster Fred J. Bennett recently received the following letter from a Jackson business man relating to the results obtained on using the air mail service.

Dear Sir: Recently, I mailed an equal number of air mail and ordinary letters. The airmail letters were not accepted or called in any way. I receive from air mail letters at the rate of \$1.00 per year and ordinary mail letters at the rate of \$1.00 per year. I am not at all sure of the exact cost of an air mail postage. I am still at all about to get some of the airmail letters. I am pleased at this rate and am thoroughly satisfied that air mail is one of the greatest business getters available to the merchant or owner of goods who cannot spare any part of his business by mail.

over by letters are slower than to be accepted by air. Consequently, mail plans can follow the Missouri chain from Brownsville into Texas, with good flying space almost in days along the line.

To Establish Airport At East Barborton, O.

BARBERTON, OHIO.—Establishment of a local airport has been started by Oscar Ritz and E. L. Allen. They have formed a local airport at East Barborton, and are planning the construction of a hangar. The field has a history of being a landing field for a short distance from the downtown business section. At the present time a West plane is being used for passenger and mail service, but it is planned to provide for both men and women. Two small offices are also provided for operators and ground crew. A 10 ft. by 10 ft. room at the end will house the chauffeur and control room. The whole building will be of the all-steel frame, in a modified Spanish architecture.

In order to aid visitors flying over Barborton, a marker will be placed on top of the Barborton High School building this fall. The work will be done by the second training class, with the backing of the Chamber of Commerce. Barborton is about 10 miles from Akron and is on the route of many planes visiting the Ohio field.

Second Hangar at Dunes

HOUSTON, TEX.—Construction has been about completed at a new hangar at Dunes Field, Longshore, to house the United States Army Air Corps. The building is T-shaped, housing one plane and accessories. This will be the second hangar on the field.

Demand Created for Wichita-Tulsa Air Line

WICHITA, KAN.—N. S. Smith, president of the Air Transport Company of Wichita, expressed some months ago, and Paul Russell, of Oklahoma City, are negotiating for an air transport service between Wichita and Tulsa, near the latter city, before, constructed in Wichita. Mr. Smith has charge of production in the N. S. Smith Airplane Co.

Even if new leads a corporation which for the past three months has supplied general aviation, including short flights, to Tulsa. Plans call for extension of the service by Jan. 1, 1939. New lines were opened between Tulsa and Oklahoma City, Tulsa and Ponca City, and between Oklahoma City and Fort Worth and Dallas, Tex. This line will connect to the Southwest the largest passenger air line in the United States, with a daily Ryan schedule of 1200 mi.

The closed air line in Wichita has reached in a brief demand for air transportation between Wichita and Tulsa, for the reason of Oklahoma City. The line between the two cities is the Tulsa and Tulsa line that is not off automobile travel by the use of airplane.

Cities in West Texas Improving Markets

FORT WORTH, TEX.—Internal improvement of the cities of this and west Texas is now resulting from legislation started by the Fort Worth Association of Commerce during the National Airports Convention. Plans are being made for the improvement of the cities of this and west Texas, and plans are being made for the improvement of the cities of this and west Texas.

New plans have been submitted for the improvement of the cities of this and west Texas, and plans are being made for the improvement of the cities of this and west Texas. The plan is to improve the cities of this and west Texas, and plans are being made for the improvement of the cities of this and west Texas.

Monroe Building New Hangars

SPOKANE, W. A. S. H.—Construction work on the new hangar at the airport is being completed by the Monroe Building Co. The hangar is being built on the site of the old hangar, and is being built on the site of the old hangar.

Kansas City Mill Increases

KANSAS CITY, MO.—A new Kansas City mill has increased, as a result of reduced postal costs. C. E. Pinner, district traffic manager of the Kansas City Mill, Inc., has reported that the mill will increase 10 to 15 per cent. The mill will increase 10 to 15 per cent. The mill will increase 10 to 15 per cent.

Philadelphia Airport To Have A-1-A Rating

PHILADELPHIA, Pa.—The Airport Improvement District, Philadelphia, has announced the contract for the erection of a large and completely equipped hangar, to be built at the Philadelphia Municipal Airport for the Philadelphia Philadelphia Ferry Service. When completed the hangar will give the field class A-1-A rating.

The entire structure, including the main hangar and hangar, will be built of the strongest, unobstructed standard steel. The main hangar, which is 10 ft. by 10 ft. by 10 ft., will be completely equipped with standard equipment for the operation of the hangar, and will be completely equipped with standard equipment for the operation of the hangar.

The large two-story hangar, 20 ft. by 100 ft. by 20 ft., will be built on the site of the hangar. The main hangar will be built on the site of the hangar, and will be completely equipped with standard equipment for the operation of the hangar.

The main hangar will be built on the site of the hangar, and will be completely equipped with standard equipment for the operation of the hangar. The main hangar will be built on the site of the hangar, and will be completely equipped with standard equipment for the operation of the hangar.

Binghamton District Reports Air Progress

BINGHAMTON, N. Y.—City and village in this district are making the steps forward with their progress. The Binghamton District, which is 40 miles north of Binghamton, has been built on the site of the hangar, and will be completely equipped with standard equipment for the operation of the hangar. The main hangar will be built on the site of the hangar, and will be completely equipped with standard equipment for the operation of the hangar.

Shaw to Build Wichita Airport

WICHITA, KAN.—R. Russell Shaw, Jr., report engineers, of St. Louis, Mo., have just been given the contract by the city of Wichita, Kan., for the development of air report.

Shaw will be the Western contractor for the Transportation Air Transport Line, and every detail of the plan for the airport will be under the direction of the city of Wichita, Kan. The plan is to improve the cities of this and west Texas, and plans are being made for the improvement of the cities of this and west Texas.

New York Field To Use Concrete

NEW YORK, N. Y.—Borough hall of New York county is expected to be built on the site of the new New York's municipal airport, according to recent statements by Clarence Chambers, Atlantic City now building the new airport in its capacity of New York City's international airport. Mr. Chambers said that the new airport will be built on the site of the new New York's municipal airport, and will be completely equipped with standard equipment for the operation of the hangar.

The money to be 20 ft. by 100 ft. by 20 ft., will be built on the site of the hangar. The main hangar will be built on the site of the hangar, and will be completely equipped with standard equipment for the operation of the hangar. The main hangar will be built on the site of the hangar, and will be completely equipped with standard equipment for the operation of the hangar.

Mackenzie-Morrow Moves to New Field

PORTLAND, ORE.—The Mackenzie-Morrow Aviation Co. on August 25 moved its operations to the Port of Portland Airport. It will occupy half of all of the large buildings and hangars now on the field. The Mackenzie-Morrow Co. is now using the field for the operation of the hangar, and will be completely equipped with standard equipment for the operation of the hangar.

The Mackenzie-Morrow Co. has opened the Mackenzie-Morrow Aviation Co. has been built on the site of the hangar, and will be completely equipped with standard equipment for the operation of the hangar. The main hangar will be built on the site of the hangar, and will be completely equipped with standard equipment for the operation of the hangar.

There is longer open for the four planes left on the field for the company. The Mackenzie-Morrow Aviation Co. has been built on the site of the hangar, and will be completely equipped with standard equipment for the operation of the hangar. The main hangar will be built on the site of the hangar, and will be completely equipped with standard equipment for the operation of the hangar.

New York-Washington Line

NEW YORK, N. Y.—Passenger air line between New York and Washington, D. C., is now being offered by the United States Air Transport, Inc., which New York office are at 110 Liberty St. The plan is to improve the cities of this and west Texas, and plans are being made for the improvement of the cities of this and west Texas.

To Join Omaha And Kansas City

*Ryan Plans Will Be Used
on New Line Which
Starts September 10*

OMAHA, NEB.—J. J. Ryan, manager of the Leavenworth and Omaha, announced that his company will establish a passenger service to Kansas City, commencing September 15. Ryan plans will use the Ryan service, and will be completely equipped with standard equipment for the operation of the hangar.

Mr. Ryan announced that the Kansas City air service would make stops at Leavenworth, Paoli City, and St. Joseph. He has secured the service of two of the new planes for the new line. Mr. Ryan announced that the Kansas City air service would make stops at Leavenworth, Paoli City, and St. Joseph. He has secured the service of two of the new planes for the new line.

The Interstate will also carry a commodity of baggage besides having a commodity for the passengers. The Interstate will also carry a commodity of baggage besides having a commodity for the passengers. The Interstate will also carry a commodity of baggage besides having a commodity for the passengers.

Pittsfield Airport Leases Airplane Site

PITTSFIELD, MASS.—The city is stated to be the owner of the airport, and is now using the field for the operation of the hangar, and will be completely equipped with standard equipment for the operation of the hangar. The main hangar will be built on the site of the hangar, and will be completely equipped with standard equipment for the operation of the hangar.

The corporation has had several offers from commercial aviation companies to use the air port under lease. At present there is one commercial company operating here, the Eastern States Aircraft Corp. of Springfield. The corporation has had several offers from commercial aviation companies to use the air port under lease. At present there is one commercial company operating here, the Eastern States Aircraft Corp. of Springfield.

[illegible]

Air Line to Link Australian Cities

*West Australia Airways, Ltd.,
to Operate Over Perth-
Adelaide Route*

Continent Lines Open Munich-Milan Service

Four Dill "Warrior" motor plan, and having accommodations for 18 passengers, will be used in the service. These plan are powered with three Bristol "Jupiter" radial six-cylinder engines having a total of 1,200 hp. and a normal cruising speed of 361 mph.

Tuning Gender in Music

STOCKHOLM, SWEDEN—A new flying school opened near here by the Swedish Aviation Society announces the arrival of 22 B737 to the flight stage in the first seven weeks. Three DHI Models, a total of 4,000 flights have been made.

To London's "Defense"

First-Class Foreign Orders



An action picture taken during the recent riots in east of London, showing a young man making ready to fly in the city's defense as violently controlled riot forces were at attacking "looting" brother shops.

THE BUYER'S LOG BOOK

Virginia Hangars

STEEL HANGARS of many sizes and designs are now being manufactured by the Virginia Bridge Co., of Radcliffe, Va., which has branch offices in a number of the principal cities of the country. The company has been engaged in the building of steel structures for nearly 35 years.

One of the most popular types of hangar manufactured by the concern is the sectional, "T" shaped, single plane



Showing accordion type folding doors used in "T" shaped single plane hangar made by Virginia Bridge Co.

hangar which is slatted hinged down and can be handled and erected easily without the use of special tools or equipment. This model is so designed that it can be used as a unit in the construction of multi-plane hangars with substantial saving in ground space and materials. When this is done the individual hangars are placed in rows with the alternate ends connected. Doors are of the accordion or folding type and operate freely and easily. The company has also prepared designs in a wide range of sizes readily adaptable to individual requirements as in ventilation, lighting and partitioning for office, store-rooms and other purposes. All models have steel frame-work with properly designed trusses and provide clear openings and spans.

Roebeling Products

A NUMBER of high quality aircraft products are manufactured by the John A. Roebeling's Sons Co., of Trenton, N. J. These products include cable and wire of all types for aircraft use, spars, power and lightning cable, steelbills, ferrules, wire rope and fittings, balloon cable and winding wire. A new catalogue has been issued by the company and will be sent on request. Branch offices of the concern are located in all of the principal cities of the country.

Only the best of materials are used in the manufacture of Roebeling products. Thorough tests are made before the metal is drawn into wire and many other tests are made during and after fabrication. Attention called for high tension work is manufactured according to U. S. Army specifications and the Navy Bureau of Aeronautics requirements.

Nemoursa Fabrics

THE E. I. du Pont de Nemours & Co., being aware of the needs of the aeronautical industry, has offered the resources of their organization for the development of materials entering the construction of airplanes. "Fabrics" has long been used for upholstery, even cockpit planes, but the cabin type of plane, which is rapidly gaining in popularity, requires a different type of fabric. To meet this demand, the Fabrics Division of the DuPont Company has introduced their Nemoursa airplane fabrics designed for interior trim. They are made on a high grade woven fabric base, processed with appropriate pyroxylin colors and embossed in distinctive patterns. The material is waterproof, durable, acid-proof, light in weight and unaffected by temperature changes. Pleating colors and attractive appearances have thus been combined with practical utility.

In the development of Nemoursa airplane fabrics the essential qualities desirable in a cabin were considered. Sturdiness should be sought in the finish of the interior and this can be gained through the use of the same material in proper grades for the ceiling, sidewalls, and upholstery. The choice of harmonizing colors is essential and through their use, an air of spaciousness is lent to the cabin.

The Nemoursa Airplane Fabrics are meeting with the approval of leading manufacturers of the country and are being used extensively for the interior trimming of cabin planes.

Bonney Wrench Set

A NEW heavy duty set of socket wrenches, made of CV Chrome Vanadium Steel, is announced by the Bonney Forge & Tool Works, Alhambra, Pa. The set is composed of 32 sockets, ranging in size from 15/32 in. to 1 1/2 in. opening. It is specially designed for



Carrying case opened showing sockets, ratchet and sliding handles of Bonney "Herodas" wrench set.

extremely hard service and as the name "Herodas" implies, is so proportioned that although light in weight it has a very heavy reserve strength factor. The set consists of 12 sockets, ratchet handle and a short and long telescopic sliding "T" handle. Each set is packed in a substantial black painted carrying case.



Instrument Based on Colonel Lindbergh's new Mahoney Monoplane, using Pioneer Instruments exclusively.

PIONEER INSTRUMENTS

OUR congratulations to the West Coast on its rapid strides in aviation!

The Pioneer Instrument Company from the first appreciated the unlimited opportunities offered to aeronautics here and, for the distribution of its products, secured the cooperation of the Pacific Scientific Company. Since 1921 the offices of the latter, at Los Angeles and San Francisco, have given Pioneer service to the entire Coast.

Colonel Lindbergh's new Mahoney Monoplane and his world-famous Ryan, both built on the Coast, were equipped with Pioneer Instruments.

Visit our booth at the Los Angeles National Air Show. See the Barth Indacorr Compass demonstrated. See the complete line of Pioneer Instruments on display. Our representatives will be glad to give you practical suggestions as to the instruments your plane should carry.

PIONEER INSTRUMENT COMPANY 754 LEXINGTON AVE. BROOKLYN NEW YORK

15 SPIAR STREET
SAN FRANCISCO

639 SO. SAN PEDRO
LOS ANGELES

The VERDICT of National Air

The best that can be said of Berry Aircraft Products is that it is a company that has produced, through industry for years.

Ed Johnson
President, Western Aircraft Corp.



Many experiences with making planes of various kinds have convinced me of the superiority of the quality of the planes I have flown in at the factory.

John F. Ward
Pilot of Training Wing at Western Aircraft Corp.

This best has been a big step in the development of our industry. It is a step that has been taken by the industry.

Alfred
Chief Test Pilot, Western Aircraft Corp.



My Canadian representative, Fred Air, has been in the industry for many years.

Frederick Kelly
President, Canadian Rogers Corp.



Al Ford, Western Aircraft Corp. has been in the industry for many years.

Al Ford
Pilot, Western Aircraft Corp.



I have used all planes in the industry, and I have found them to be of the highest quality.

Charles H. Hays
Chief Test Pilot, Western Aircraft Corp.



I have been a pilot in the industry, and I have found them to be of the highest quality.

Alfred
Pilot for Western Aircraft Corp.



I wish to emphasize the quality of the planes, and I have found them to be of the highest quality.

William H. Hays
Pilot, Western Aircraft Corp.



The Berry Aircraft Corp. has been in the industry, and I have found them to be of the highest quality.

William H. Hays
Pilot, Western Aircraft Corp.



We, Western Aircraft Corp., have been in the industry, and I have found them to be of the highest quality.

William H. Hays
Pilot, Western Aircraft Corp.

Tour Pilots.

"UNEXCELLED pilot job"....."Berry products adapted excellently"....."Unexcelled results"....."nothing equal to them"....."It is a great pleasure to see the results of the Berry Brothers' work in the industry."....."It is a great pleasure to see the results of the Berry Brothers' work in the industry."....."It is a great pleasure to see the results of the Berry Brothers' work in the industry."

You know these names by reputation at least. Surely their judgment is sound and mature. Please read these opinions, with the evidence carefully, and render your own verdict.

Let us emphasize three points. Berry Brothers is evolving rapidly as it is trying to improve Progressive Aircraft Products, already voted best obtainable. The services of an expert aircraft designer are always at the disposal of manufacturers seeking the utmost in protection and beauty for their ships.

For the Berry Brothers' exhibit of Progressive Aircraft Products at the International Exposition, Los Angeles, Sept. 1-10, and the Berry Brothers' place entered in the show at New York in Los Angeles Air Derby and the National Air Derby.



The Berry Brothers are the best in the industry, and I have found them to be of the highest quality.

Alfred
Pilot, Western Aircraft Corp.



The Berry Brothers are the best in the industry, and I have found them to be of the highest quality.

Alfred
Pilot, Western Aircraft Corp.



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Alfred
Pilot, Western Aircraft Corp.



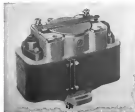
Member
Associated
Chambers
hereafter

BERRY BROTHERS
Varnishes Enamels and Lacquers
Detroit, Michigan 215-77th Anniversary-215
Wilkesville, Ind.

Manufacturers
of Progressive
Aircraft Products

Splitdorf Magneto

THE MODEL V A Double vertical aircraft magneto, manufactured by the Splitdorf Electric Co., 200 High St., Newark, N. J., has been developed to provide dependable ignition for the latest types of modern airplane engine having from four to twelve cylinders. The Splitdorf Company has been engaged in the manufacture of



Model V A double vertical aircraft engine magneto manufactured by the Splitdorf Electric Co.

ignition devices for a number of years and was one of the pioneers in developing magnetos for the aircraft industry.

The Model V A magneto has two independent electrical circuits and produces four double sparks per revolution, either synchronized or staggered. It is provided with a spark advance of 30 deg. The total weight less distributor block, is 12½ lb.

Splitdorf aircraft products include types of magnetos for all classes of engines having from two to twelve cylinders as well as a number of other ignition devices for airplanes.

Curran Lubricator

TO ELIMINATE the time wasting system of lubricating cutting tools by squirt can or paint brush, a portable lubricator has been developed by the Curran Machine Works, 120 Niagara Road, Long Island City, N. Y. The device is a high speed lubricator designed for use on all machines not equipped with their own lubricating systems.

The Curran lubricator is foot operated, leaving the mechanic's hands free to handle the work and thus resulting in production increases of from 25 to 100 per cent. It consists of a reservoir with foot pedal attached and a feed pipe of small diameter which is directed to the machine to be lubricated. The end of the feed pipe can be drawn down to fit in a groove or on the face of a drill. The lubricator can be moved from one machine to another very quickly. A finger nut adjustment regulates the quantity of lubricant delivered at each stroke of the pump. The Curran lubricator can be used with drilling machines, lathes, hand mills and for general bench work. The company also manufactures lubricators for multiple spindles.

Exide Storage Batteries

WITH THE increasing popularity of night flying many manufacturers are including complex lighting equipment in their plans and the storage battery is rapidly becoming a necessity in the equipment of aircraft. An efficient unit, especially designed for airplane use, is now being manufactured by the Exide Storage Battery Co., of Philadelphia, Pa. This battery is designed for starting, lighting, signaling or for any of the other purposes for which an airplane battery is ordinarily used.

Two general models of battery are offered by the company. The Type TX is built in three sizes to meet all



Type TX battery (left), is built for starting, ignition and lighting purposes. Type AC (right) is for ignition.

requirements of 12 volt starting motors, ignition and lighting systems while Type AC is built in two sizes for 12 or 8 volt ignition purposes. These batteries are built with extreme care, furnished in one piece hard rubber containers and so designed that they can be laid on their side or turned over without spilling the electrolyte.

Exide batteries are built to provide great power with the minimum of size and weight and meet all Government requirements, being standard equipment on Army and Navy planes. In addition they are used on rail planes.

Improved Milburn Spray Gun

INCLUDED IN the paint spray equipment manufactured by the Alexander Milburn Co., 1035-1018 W. Baltimore St., Baltimore, Md., is the new type E. F. Milburn Spray Gun which embodies several improvements over the old Type E. The new

model is provided with a means of adjusting all adjustments thus eliminating the necessity of experimenting to find correct adjustments after they have once been made.

The outstanding feature of the Type EF is the hand which is fitted and gives numerous spray adjustments from a circular spray to a fan. The range of adjustments provided is wider than usual with spray guns. The design permits the operator to obtain any desired spray instantly without making tests. A series of indicator markings on the paint valve plunger make it possible to obtain the exact volume desired and again so time is lost by testing. Thus the operator, knowing a certain adjustment to be correct for a given class of work, loses no time in making the desired adjustment.



Gun with color-coded adjustments.

Announcing... THE CURTISS CHALLENGER

Two banks, six cylinder, air cooled radial motor
Dept. of Commerce Type Certificate No. 5



CHARACTERISTICS

Horsepower	170
R.P.M.	1600
No. of Cylinders	6
Arrangement of Cyl.	2 Radial Rows of 3
Bore	1 1/2"
Stroke	4 1/2"
Diameter	42 1/2"
Displacement	431 Cu. In.
Weight	400 Lbs.

THIS novel arrangement of cylinders in two banks with double throw crankshaft provides small front area and freedom from vibration, with accompanying reliability and long life.

The Challenger is offered to the Industry at a price and under conditions which will interest the private owner, the commercial operator and the aircraft manufacturer. Catalog on request.

See it at
Los Angeles

CURTISS AEROPLANE & MOTOR CO., Inc.

Offices: Clinton Road,
Garden City, N. Y.

Factories: Garden City, N. Y.
Buffalo, N. Y.

Curtiss

TRADE MARK for numerous AVIATIONS

CONSOLIDATED

Standard on most American—



Consolidated Instrument Panel

More and more aircraft manufacturers are adapting the Consolidated Type A Aircraft Instrument Panel as standard equipment. Convenience and efficiency are combined with notable attractiveness in

this indirectly illuminated grouping of dependable Consolidated Instruments. This fine panel is now standard equipment on the airplanes of many leading American manufacturers.

Note: Realizing the growing desire for special Consolidated equipment we will undertake to supply specially equipped instrument panels to manufacturers whose volume warrants individual specifications. Write us for further details.

CONSOLIDATED

of America, Inc.

Western Representative: W. E. Hulse,

INSTRUMENTS

made commercial airplanes

The accompanying chart visualizes the constant growth of airplane production . . . and the present approximate rate of manufacture (planes per 12-month period) . . . as indicated by the current delivery schedule of Consolidated Instruments.

Consolidated Instruments, singly or in sets, are used on approximately 94% of the commercial airplanes manufactured in the United States.



Consolidated Instruments are used by the following representative aircraft manufacturers—

Adams Aircraft Co. ("Fies")
Alexander Industries, Inc. ("Light-
air")
American Eagle Aircraft Co.
Armstrong Aircraft Corp.
Bath Aircraft Co.
Boeing Aircraft Co.
Beech Aircraft Co.
Boeing-Walker Aircraft Co.
Boeing-Walker Aircraft Co.
Boeing-Walker Aircraft Co.

Curtis Wright Corp.
Curtis-Wright and Motor Corp.
Curtis-Wright Aircraft Corp.
Deere Aircraft Corp.
Fairchild Aircraft Manufacturing
Corp.
Fairchild Aircraft Corp.
Fairchild Aircraft Corp.
Fairchild Aircraft Corp.
Fairchild Aircraft Corp.

Garrett Aircraft Corp.
General Aircraft Co.
General Aircraft Co.
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General Aircraft Co.
General Aircraft Co.

INSTRUMENT CO.

41 East 42nd St., New York

5391 Broadway, Oakland, California

Quartz Gauges Engine Gauges Fuel Gauges Instruments Clocks Warning Lights Landing Lights Dash Lights

Altimeters Thermometers Anemometers Oil Pressure Gauges Compasses Temperature Gauges Air Speed Indicators Instrument Panels

Carbic Floodlight

FOR FIELD locations where no source of electric current for lighting is available, portable carbic floodlights will be found invaluable in night construction and operation work. These lights are also used when night work is to be done in the remote portions of airports having electric power and as part of the emergency equipment. A highly efficient unit of this type is manufactured by the Crowell Acetylene Co., which has offices at 30 East 53rd St., New York, and in other large cities and full information will be given on request to any of the company's offices.

The Crowell Carbic Light is of simple and rugged construction, consisting only of three parts with no complicated adjustments. It can be charged by our men in a few minutes and requires no further attention until the charge is exhausted. The acetylene flame furnishes a clear penetrating white light for 5 to 12 hours on a single charge. It operates under all weather conditions and is equipped with a screen proof burner, permitting its use even in heavy winds. The unit is safe under all conditions and it automatically shuts the way gas out and gas generation stops immediately. It is listed as standard by the Underwriters Laboratories, Inc.

Gas for this light is generated by water coming in contact with "Carbic," a fuel in cube form distributed by the Union Carbide Sales Co. These cubes are made in standard sizes making it possible to change the light (on a given period of operation without unnecessary waste. The action of the device is entirely automatic.

The unit is made in several different styles ranging from 16 to 79 lb. in weight capacity. One of these models is equipped with two burners and reflectors permitting the use of both at the same time where an extra volume of illumination is required. The same type of generator is used in all models.



Single burner carbic light.

shields of non-shatterable glass are provided both in the front and on both sides and are easily operated. There are also two sliding collared doors above the cockpit through which ingress and egress are possible.

Wheel control and rudder pedals adjustable for two positions are provided. Besides, throttle controls so free of interference, hot air intakes, individually controlled for extraneous, retractable landing lights and two parachute flaps are all operated from the pilot's cockpit. The instruments include a compass, turn and bank indicator, clock indicator, airspeed indicator, altimeter clock, gas and oil pressure gauges, oil temperature gauges and tachometers. Metal adjustable propellers are used and they also do not overlap.

An aisle with a door at each end connects the pilot's and passengers' compartments and passes the baggage



Side view of the Boeing 80, (3 "Hornet").

and mail compartments which is located between. A separate door in the fuselage provides access to the baggage compartment, which has a capacity of 90 cu. ft. By reducing the size of the baggage compartment the passenger capacity of the plane can be increased from 12 to 16 or as high as 20.

Complete electrical equipment is handled in the plane and includes a generator, two batteries, control box, valve and ammeter, three electric inertia starters and booster system for the engines. A 120 volt electric heating coil, thermostatically controlled, keeps the hot running water at a temperature of 180 deg. F.

Landing gear of the triad type is used with two oleo struts for each wheel, shock absorber in a fore and aft direction when landing. Welded steel tubing is used in the construction of the landing gear which has a tread of 18 ft., 2 in., and employs 44 in. x 10 in. wheels.

The specifications as furnished by the manufacturer are as follows:

Dimensions:	
Length overall.....	55 ft.
Height overall.....	14 ft. 8 in.
Upper wing span.....	60 ft.
Upper wing chord.....	120 in.
Lower wing chord.....	86 in.
Stagger.....	8 deg.
Dihedral.....	2 deg.
Incidence.....	0 deg.

Areas:	
Wing area (including ailerons).....	1,350 sq. ft.
Total aileron area.....	102 sq. ft.
Total stabilizer area.....	79 sq. ft.
Total elevator area.....	67 sq. ft.
Total rudder area.....	36 sq. ft.
Total fin area.....	25.6 sq. ft.

(Continued on page 740)

The Boeing Model 80

(Continued from page 735)

Metal racks for hats and neck towels are placed along the side walls near the ceiling.

On a panel at the forward end of the cabin there are mounted a large size altimeter, airspeed indicator and clock. Below these instruments is a bulletin board on which a map of the route and other information for passengers can be posted. In a compartment forward of the passenger cabin is a small buffet from which coffee and light lunches can be served. Aft of the main cabin is a large and well appointed toilet room. Provision has been made for hot and cold running water.

The pilot's cockpit, which is located in the nose of the fuselage, is designed to provide adequate protection for the operators under all weather conditions. Particular attention has been paid to visibility in bad weather. Wind-

The Consolidated Courier

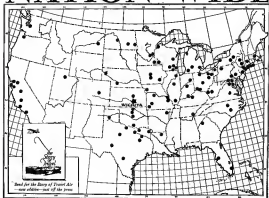


Consolidated Aircraft Corporation
Buffalo, N. Y.



THANK YOU for making AVIATION

NATION WIDE



THE House Roll of Travel Air distributors and dealers now numbers 106. These names and addresses are on the opposite page. These are the men who have made aviation history. These are the men who are the pioneers in the new and fastest growing business in the world. These men realize the "Air Age" is here—that aviation is no longer a game but an industry, the vast possibilities of which have not been scratched—but the greatest developments in aviation is just ahead.

Like any other business, these men want to build the best. That's why they have selected Travel Air—the company with the reputation—the company known the world over for the proven performance, with dependability of their design—the company making right types of airplanes to fill every commercial need, including the new Cabin Monoplane—the "Lancaster of the Air."

The story may show your Travel Air distributor who not only sends correspondence but will give you any information you desire and will receive questions and address orders at all times.



THANK YOU for watching AVIATION

TRAVEL AIR DISTRIBUTION

AVIATIONSPORT CORPORATION—One House, Mrs. BERRY, 1121 E. 1st St., Grand Forks, N. D.
C. G. BERRY, 1121 E. 1st St., Grand Forks, N. D.
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The Standard of Aircraft Comparison
TRAVEL AIR MFG. CO., INC.
WICHITA, KANSAS



THANK YOU for watching AVIATION

(Continued from page 736)

Wing section	.....	34-22
Weights:		
Wing empty	.....	5,220 lb.
Loaded	.....	6,645 lb.
Yield	.....	180 lb.
Fuel (340 gal.)	.....	2,690 lb.
Oil (27 gal.)	.....	190 lb.
Armament	.....	3,637 lb.
Passenger capacity	.....	12
Gross weight loaded	.....	15,294 lb.
Performance:		
High speed	.....	128 m.p.h.
Landing speed	.....	55 m.p.h.
Rate of climb	.....	700 ft. per min.
Climb in 10 min.	.....	5,700 ft.
Service ceiling	.....	14,000 ft.
Take-off run	.....	825 ft.
Take-off time	.....	31 sec.
Wing loading	.....	123 lb. per sq. ft.
Power loading	.....	9.69 hp. per hp.

The Aviation Industry in the West

(Continued from page 736)

planes were discussed. Lloyd Stassen had built a plane or two of his own at Santa Monica. The International Aircraft Corp. likewise was making itself felt by competitors.

Today, the West boasts two of the most important manufacturers of military aircraft, a commercial manufacturer with one of the greatest outputs of any in the country, two factories producing innovations in aerial vehicles, and any number of experimenters, small manufacturers and factories which have not yet gone into production.

Outstanding among the western manufacturers, of course, is the Boeing Airplane Co., which is now turning out both military and commercial planes. The Boeing pursuit plane is known among flyers for its reliability and performance. The Company is now engaged in producing a line of 12 passenger, three engine planes to be used by the Boeing Air Transport Co. in flying between San Francisco, and Chicago, Ill. Other types, which have not yet been announced, are also in the process of manufacture. The plane manufacturing company has held consistently to the biplane. It has gained a fine reputation, through the performance and reliability of its planes, and for excellence even that is used in their construction.

The Douglas Co. stepped into fame through construction of the "around-the-world" planes, used by the Army in its famous flight in 1931. The Douglas mail plane, constructed later for use on the government and contract air mail routes, added to the company's renown. One of these planes has flown 1,275,000 mi. It has always been on time. It has never had an accident, or mechanical failure of any kind. Several other planes of this type have records almost as good. The "D2," manufactured by this company, is quite well-known. The company also has manufactured transports and various types for the Army and Marine Corps.

The company which manufactures Ryan planes, of which E. F. Mahoney now is the head, came to the attention of the public with Lindbergh. It was in the San Diego, Calif., factory of this plane manufacturer that the famous "Spirit of St. Louis" was constructed. This was one of the earliest radio monoplane built by the company. Formerly production was confined largely to

the period type of open monoplane. This plane was designed for the contract air mail carriers. The company is now building the Ryan biplanes, but despite the efforts of the factory engineers, production has not been able to overtake the demand.

The Kinner "Armistice," a product of seven years' experimentation by the Kinner Airplane and Motor Corp., of Glendale, Calif., is being manufactured by the Crown Carriage Works under contract with the Kinner Company, which is now devoting all its attention to engine building. The popularity of the "Armistice" is growing. Numerous



Rear quarter view of the Boeing B1 light biplane, powered with a 135 hp. Pratt & Whitney engine.

as the design has been standardized, and production methods are being applied, it presently will not be long before a great many of these are seen in the air. The Kinner Company is producing a few cylinder radial air-cooled engine which develop 100 hp. It is supplying three of these engines a week to the Crown Carriage Works, for installation in the Armistice manufactured by this firm.

The Ring Aero Advertising Service, of Los Angeles, is building a typically German, low-wing monoplane with a plywood wing and a welded steel fuselage. The Tinea Airplane Corp., Glendale, which has been constructing a variety of planes for some time, has about solved its production problems, and expect to manufacture on one type of plane soon. The Bach Aircraft Co., of Santa Monica, builder of Bach "Air Yachts," has sold a number of its three engine open monoplane. The company is going ahead rapidly now with plans for big production.

Flight of Duck Air Yachts

The West Coast Air Transport Co. has instituted a twice daily service between Seattle and Portland, Oregon, and is maintaining a schedule of three flights weekly between Portland and San Francisco. The equipment consists of a number of Duck Air Yachts. Each is powered with a Pratt and Whitney "Wasp" mounted in the nose, and two Ryan-Stinson engines mounted at either side under the wings. There have been no mechanical failures.

The Bach planes have a high speed of 150 m. p. h. and cruise at 110 in p. h. Since the inception of the service, which has been interrupted a few times on the Seattle-Portland run as the result of bad weather, 4,000 passengers have been carried in the planes operated by the West Coast Transport Co. Forty per cent of these passengers have been women.

The Lockheed "Vega," which drew wide attention by entry of a plane of this type in the Duke flight, has been joined by a cousin ship, the Lockheed "Air Express." Both of these planes embody the folded, increased wing surface and wings developed by Alton Loughhead.

(Continued on page 746)



1,000-hp. Pratt & Whitney engines, 135-140 mph. (See p. 740)

Fast — Safe — Economical Payload Airplane for Students, Owners and Operators

Control appearance is an indication of inside quality—the class in "Air-King" Model 28 is a wonderful piece of workmanship clear through. There's an airplane you will be proud to own and fly. Features of seamless steel tubing, riveted cowling, steel streamlined struts, shock absorbing under-carriage, streamlined flying, dual and dual wing; aluminum disc wheels, full width tread (field), hard run and rocky country are only a very few of its many advanced advantages.

Therefore choose above any completely "Air-King" airplanes have cut down passenger numbers—providing speed with ease of control. Wide wheel under-carriage protects wing tips in landing on uneven ground. Side entry is featured. Full forward vision provides necessary flying.

Positive lateral control (even at stalling speeds) is insured by loop, aileron and aileron. Pilot will appreciate the complete shock equipment, which includes: shock-absorber, shock struts, water suspension, shock absorber, all pressure gauge. Adjustable midline control and throttle are within easy reach. Fully balanced dual controls are provided.

SPECIFICATIONS OF Model 28 "Air King"

Span, Upper Wing	32' 0"	Length Overall	32' 0"
Span, Lower Wing	24' 0"	Wing, Tip to Tip	150' 0"
Wing Area	1,000 sq. ft.	Wing, Tip to Tip	150' 0"
Current rate	4.10	Wing, Tip to Tip	150' 0"
Wing Area	1,000 sq. ft.	Wing, Tip to Tip	150' 0"
Wing Area	1,000 sq. ft.	Wing, Tip to Tip	150' 0"
Wing Area	1,000 sq. ft.	Wing, Tip to Tip	150' 0"
Wing Area	1,000 sq. ft.	Wing, Tip to Tip	150' 0"
Wing Area	1,000 sq. ft.	Wing, Tip to Tip	150' 0"
Wing Area	1,000 sq. ft.	Wing, Tip to Tip	150' 0"

Just off the press—immediately to our Air-King Catalog that describes fully Model 28 Air King.

National Airways System, Field 7, Lomax, Ill.



Air-King dual control seat, dual controls on all instruments.



Air-King under-carriage provides shock absorber, shock struts, water suspension, shock absorber, all pressure gauge.



Pratt & Whitney engines are mounted on the main fuselage, providing dynamic strength.

WACO

SUPREMACY



A Waco Ten with special equipment built to the order of Mr. T. Hughes Embury of Cincinnati.

Reasonably prompt deliveries men now have had on the WACO Special, similar to the National Air Tour Winner, with Wright Whirlwind Motor, Metal Propeller, Bendix Brakes, Hand Crank Starter, Compass, Air Speed, Bank and Turn Indicator, both cockpits upholstered, luggage compartment, center section tanks giving total of 90 gal. gas capacity—with customers choice of colors throughout—ready to flyaway at Troy—\$8630.00

WACO won the National Air Tour by demonstration of the same quality of performance that has in the last seven years, been responsible for WACO'S leading position in the industry.

The scoring was on the basis of a formula developed by the Tour Officials to disclose the greatest all-around airplane efficiency. This involves quick take-off, load carrying ability, slow landing speed and high touring speed—

—and WACO WON by a margin of almost 3000 points.

The preliminary tests not only gave WACO an outstanding figure of merit but in 6500 miles of flying WACO scored 99¼% perfect and on time.



The Advance Aircraft Co., Troy, O.

The AIRSEDAN



139 m. p. h.

By official test, the fastest
ship in the Reliability Tour

Specifications

Wight Empty	1,100 lbs.
Wing Span	36 ft.
Wing Area	240 sq. ft.
Length	21 ft.
Useful Load	1,400 lbs.
Seating Capacity	Pilot and 2 Passengers

Performance

High Speed (Sea Level)	139.1 M.P.H.
Landing Speed	41 M.P.H.
Cruising Speed	113 M.P.H.

Power Plant

Engine	Whitcomb
Horsepower	200 to 1,100 B.T.U.
Fuel Capacity	30 gals.
Oil Capacity	3 gals.

Equipment

Stearns, Brakes, Metal Propeller, Gasco, Air Speed Indicator, Navigation Lights, Tachometer, Altimeter, Clock, Fire Extinguisher, Fuel, Oil Pressure, and Oil Temperature Gauges, Air Corps Thermals, Sinker and Fuel Valve, Exhaust Manifold, Cabin Heaters.

Manufactured Under Approved Type Certificate No. 2

Price \$12,000

Factory at Fowl, Marysville, Michigan

Buell Aircraft Company
MARYSVILLE, MICHIGAN

PLEASE YOU for mentioning AVIATION

(Continued from page 242)
are noted for their cleanliness in design and for their high speed.

The Federal Aircraft Corp., formerly known as the Ryan McCaskey Monoplane Co., Los Angeles, is building a high-wing, cabin monoplane, which is something of an innovation in that its entire structure is of welded steel tubing, although it is covered with fabric in the conventional manner.

Thundershirt Aircraft, Inc., of Glendale, is building a three-place biplane which has been favorably received. It is selling readily, particularly in Southern California. Under the management of Theodore T. Winkley, president, this company has increased its production to three planes a week.

Farther to the north is the Bense Aircraft Co., of San Francisco. Two Bense planes were entered in the Dale flight, one of these winning second place. This concern has built but one type of plane as far. It is a six-place cabin monoplane, powered with a "Warrior" engine. Bense planes are now being flown by Capital Airways on its line from Sacramento to Oakland, Calif.

In San Francisco, also, is the Thaden Metal Aircraft Co., producer of the first metal monoplane designed and developed in this country. This factory, recently started out its first plane of a new type. It is a full cantilever wing, cabin monoplane, employing multi-spar construction in the wing and the monoplane principle in the fuselage. This plane, like the T-1 model, is constructed entirely of steel.

At San Leandro, across the bay from San Francisco, Aircraft Industries has completed its first three-place cabin monoplane, which shortly will be marketed under the name "Storrs."

Engleberg Sets New Production Record

Production in the new Engleberg factory in Columbia Springs now has reached approximately one plane a hour. This is outstanding as a production record for the West, if not for the entire country. The types, produced so far, have all been open lighters, sharply differentiated by their varied wings. However, officials of the company say that the manufacture of a cabin plane is contemplated. Two engines are being experimented with, which the company may decide to manufacture also.

At Santa Ana, the Zenith Aircraft Corp. engaged in building planes to order, as is the K. W. Martin Aircraft Co., situated at Clover Field, Santa Monica. The Irvan Aircraft Co., of Sacramento, is manufacturing the "Monoplane," a light open lighter, for which the same company has developed a small, light engine. The U. S. Aircraft Corp., of Spokane, has obtained licenses to manufacture planes under the English Avon patent, and aircraft engines under the Cirrus patent.

America's engine builders, the Waco, has four outstanding manufacturers of 100 to 130 hp. engines, most of which are being produced in an effort to fill the postwar field until assembly by the "GOES" Co. The Halton Mfg. Co., of Los Angeles, is producing a seven-cylinder 130 hp. radial engine. An auxiliary engine has been constructed for a large number of these engines. The Halton Company has long been engaged in building engines. Besides its machine works, it operates its own factory.

Frank C. Olinovich, Inc., of Los Angeles, is producing a seven-cylinder, 150 hp. radial engine under the trade name "Floco." Preparations are being made for quantity production. The Aircraft Engine Co., Inc., of Oakland, is producing a seven-cylinder, 135 hp. radial engine. This company now has 25 engines on the production line, and is said, by one of the executives, to have released a num-

The SPIRIT of PROGRESS



IN this age, the spirit of progress manifests itself in the application of scientific knowledge to the needs of modern life. The engineer—the practical scientist—finds his duty in constantly seeking new ways and means to further that end. But yesterday he was developing the motor car. Today the spirit of progress calls upon the best engineering talent and skill to promote aviation.

It is quite in accord with its traditions that Champion should respond to the demand of modern progress by turning to the forging of airplane parts. For years Champion engineers have rendered valuable service to the automotive industry. They have grappled with and conquered the most formidable forging problems. With perfection as their ideal, they have pushed on unflinchingly

experience in the production of forgings. The value of such experience is not to be expressed in plain figures or evaluated in dollars and cents—but it is all the greater because it is irreplaceable.

Then Champion offers the co-operation of a staff of expert engineers—men who have solved the most difficult problems in the automotive industry. Learned, skilled, resourceful, they never admit defeat and are never satisfied with any solution that is not correct beyond the shadow of a doubt.

If you are interested in learning how Champion could help you in your work, write us. Our engineers will gladly apply themselves to the solution of your problems.

The Champion Machine and Forging Company
Cleveland, Ohio

Fully Equipped Laboratory
and Heat Treating Facilities

CHAMPION DROP FORGINGS



Frequently, a fitting which is made of many parts welded together can be drop-forged all in one piece, giving added strength and saving much labor.

PLEASE YOU for mentioning AVIATION

C & L 32

This is one of the most serious things that can happen to a pilot. It is a very serious thing, but it is because of it that the most important thing in the life of a pilot is to be able to handle a C & L 32. It is a very serious thing, but it is because of it that the most important thing in the life of a pilot is to be able to handle a C & L 32. It is a very serious thing, but it is because of it that the most important thing in the life of a pilot is to be able to handle a C & L 32.



Patented Clayton & Lambert improvements mean longer, better service

A necessary hole body, and it has to do a lot of hard work. But this is a very serious thing, but it is because of it that the most important thing in the life of a pilot is to be able to handle a C & L 32. It is a very serious thing, but it is because of it that the most important thing in the life of a pilot is to be able to handle a C & L 32. It is a very serious thing, but it is because of it that the most important thing in the life of a pilot is to be able to handle a C & L 32.

As a result, Clayton & Lambert, who have been in the most serious thing, but it is because of it that the most important thing in the life of a pilot is to be able to handle a C & L 32. It is a very serious thing, but it is because of it that the most important thing in the life of a pilot is to be able to handle a C & L 32. It is a very serious thing, but it is because of it that the most important thing in the life of a pilot is to be able to handle a C & L 32.

CLAYTON & LAMBERT

MFG. CO.
Detroit, Michigan

lar of orders, one for 200 engines, owing to the nature of its production program.

Other Pacific coast manufacturers listed by the government are the Aircraft Engineering Co., Airways Mfg. Co., Dyce Airport, and Federal Aircraft Corp. of Los Angeles; Pease Airplane & Motor, Alhambra, Calif.; Silverwing Aircraft Corp., Redlands, Calif.; W. A. S. Airplane Co., Oakland; Waterhouse Aircraft Co., Hollywood, Calif.; and W. F. W. Aircraft Co., Los Angeles, Calif.

Insurance Underwriters and Aeronautics

(Continued from page 702)

And these are not the only problems and difficulties which beset the controllers of early a day. Others there are represented by schemes full of imagination and experience to run before learning to walk—delightful "pioneering," which, if they would only work, would certainly create a financial paradise in the air. However, the successful development of commercial aviation demands an insurance foundation down to the solid region of the proverbial and prosaic horse trade—a solid and solid region where business principles are enforced, and the planer of the air is confined strictly to its proper and useful position of a successful go-getter nation.

Air operators, manufacturers, finance companies, pilots, airport managers, etc., are in business to stay. They are putting their capital and enterprise into commercial aviation, and they must, in the public interest, be enabled to spread the losses incidental to a pioneer movement in such a way that no sound commercial aviation interest will feel the result of unexpected catastrophe.

That can be done on the basis of sound underwriting, founded on a real knowledge of their requirements and sympathetic cooperation between themselves and the underwriter. My twenty years in aviation and sixteen years in aviation underwriting income me, beyond a doubt, that there is not a single difficulty, problem or disaster factor that cannot be solved very quickly by personal cooperation. I have lost count of the numerous cases in which unsatisfactory aviation enterprises and salesmen have been rendered profitable and insurable by means of cooperation, but it takes too long to do it.

The underwriter must analyze and help constructively and the applicant for insurance must make an intelligent study of the insurance aspect of his enterprise, so he can be expanding a little time in studying the insurance. Factors and explosive matter. The insurance broker can be of the greatest assistance to both the applicant for insurance, when they represent, and also the underwriter with whom they deal, provided they do not regard aviation business as a side line or a sideline, but with an eye to the future, take pains to learn something about aviation and the requirements of air operators. Also to make an intelligent study of the insurance factors and explosive matter. Those brokers who have tried themselves to render useful service to aircraft operators and to deal intelligently with the underwriter have in most cases developed a very satisfactory volume of business.

To those who may consider that the foregoing is too general and "does not get there anywhere," I venture to address the following few words from the shoulder of experience in paying insurance losses.

In the final analysis, insurance rates are determined by the air operators themselves since the rates depend upon the degree of hazard in their operations, which are under



A Better Ship!

The Command-Aire



Factory Running 50 Per Cent Overtime to Supply Demand for the Command-Aire!

Nothing could more simply and completely tell the story of Command-Aire Success.

Advanced Design
Rugged Construction
Beautiful Appearance
Outstanding Performance

DEALERS from all parts of the country are recognizing the Command-Aire as a good will builder, easier to sell and offering one of the most attractive and profitable franchises in the industry. Your territory may still be open.

Price, \$2,000 complete, less motor and propeller, at Little Rock, \$2,200 at Little Rock, complete, with motor. U.S. Model.

Descriptive folder and details of dealer franchise upon request.

Arkansas Aircraft Corporation

LITTLE ROCK, ARKANSAS

TRADE TO BE MARKED AVIATION



When he levels off ...
will the crowd rush
onto the field ... into danger?

TRAGEDY stalks the airport where spectators stampede at will. Mortared by enthusiastic people will rush into the path of a roaring ship ... terrified of a flashing propeller biting through the air ... forgetful that the pilot may crash in an attempt to avoid them.

Accidents retard the progress of aviation. Endorse safety with a fenced enclosure for visitors.

Effective restraint of the most enthusiastic throng is provided by an Anchor Chain Link Fence. Posts and gates are the strongest made. Drive-Anchorage holds the fence firm and true. Square Terminal Posts add to the attractiveness of the enclosure. These are exclusive features found in an Anchor Fence of every height and type. Have the local Anchor Fencing Specialist explain them ... his experience and trained structure are at your command.

ANCHOR POST FENCE CO.
EASTERN AVENUE and 11th ST., BALTIMORE, MD.
Albany, Boston, Chicago, Cincinnati, Cleveland, Denver,
Detroit, Kansas City, Louisville, Los Angeles, Miami,
Minneapolis, New York, Philadelphia, Pittsburgh,
St. Louis, St. Paul, St. Petersburg, Tampa,
Wilmington, and other principal cities.
Consult telephone directory.



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their control and not under the control of the insurers. This provision could be relaxed largely (by some forty percent, I think) if general effect were given to the existing and constructive suggestions contained in the Aircraft Fire Prevention Circular, prepared by R. H. Gundersen, Material Division, Air Corps, and published by the Chief of the Air Corps, Washington, D. C. in Vol. VI No. 592 on Sept. 15, 1937.

Provisions for all risks into which flying enters could be very greatly decreased if the standard of flight instruction were improved. In my opinion, there is a crying need for a school for the instruction of flight instructors, and I believe that if properly run, it would have an early and tremendously beneficial effect upon the average quality of flying with consequent material decrease in aviation insurance rates. The country contains plenty of excellent pilots of great potential value as instructors, but it is one thing to know flying well and to be capable of it, and quite another thing to introduce into a novice that same knowledge and capability. The Great War was half over before that was understood, and many will remember the extraordinary advances in the quality of flying after the establishment of certain schools of instruction for flight instructors. The establishment of such a school would, of course, demand recognition on the part of a sufficient number of flying schools and require the support of the principal employers of pilots. I suggest the strong desirability of an effort being made along these lines.

Replying to published opinion that aviation insurance rates are "too high," and appealing for the insurers' I represent, I declare that we consider ourselves fortunate indeed if all our different "lines" of insurance break even, and that we would be most happy to cover all and any of the risks of any group of responsible air operators large enough to provide an average if we are guaranteed no more than five per cent. return on our investment.

Reduced to the lowest possible words, our whole work and endeavor is to strike a happy medium between profit and loss, and to provide an insurance protection service under which the development of commercial aviation may progress harmoniously and without extraordinary financial setback. If we go beyond that intention, whether in favor of the insured or the insurer, we are on unsteady ground. If we realize that intention, as we believe we are doing, then we shall develop hand in hand with commercial aviation.

Regarding Airports in California

(Continued from page 700)

plied a port with two opposite runways each 2500 ft. long. This is as fine a field as anywhere in the West.

Visitors to work on a regional port. San Francisco and Oakland in their fields are adding equipment and otherwise bettering their physical conditions. Oakland, according to its plans, will have an excellent port. Adjacent the Oakland Municipal Airport will be a channel which will provide speed boat communication for mail, express and passengers to other bay cities. This channel, it is expected, will be completed in September and a fourth barge will be floated sometime in October and will measure 120 x 300 ft. Oakland has wanted that more and more space will be required. The first two barges measured 90 x 200 ft. and No. 3, 120 x 200 ft.

San Diego on August 16, 17 and 18 dedicated its new Lindbergh Field. At that time the factor considered, in whose hands control is vested, had been to work six months on the property, which will be largely filled in by the edge of the bay. Some of our experiences may be

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of interest to other communities engaged in similar enterprises.

On Nov. 22, 1927, the people voted \$650,000 in bonds for the construction of the field to be located on the tide lands. The Harbor Department in order to speed up work engaged a crew of engineers to survey and take soundings. Many thousands of soundings were taken. These developed the fact that 2,600,000 cu yd of mud would be required to fill an area sufficiently large to bring a "Triple A" rating by the U. S. Department of Commerce. This meant a 33 of 342 acres of land, or 42 more than was planned when the bonds were voted.

For temporary use, a runway 300 ft wide at one end and 500 ft wide at the other, and 2500 ft long, has been prepared. To level for this purpose, 35,000 yd of dirt was moved on the field.

13 Airports Near Los Angeles

Los Angeles does not yet have a municipally owned port, yet there are 13 permanent fields in and closely adjacent to Los Angeles. This does not include those in individual municipalities close to Los Angeles. Some idea of the development of the 13 may be gleaned from the following details:

1—The MacClathrie Aeronautical Co. maintains at Compton, at an elevation of 200 ft, a field 600 x 2000. The east-west runway is 2,000 ft long; the surface is wet soggy in unusually wet weather. There is a shop with hangars.

2—The American Aircraft Corporation maintains at Culver City at an elevation of 200 ft, a field 345 x 1,000. This is located four miles south of Culver City. On the front of the hangars may be noted the signs, "American Aircraft Corporation-Fairfield-Waco." The runways east and west measure 1000 ft. There is a machine shop, restaurant, phone and complete service and our service to Los Angeles.

3—The California Aerial Transport Co. maintains at Culver City, at an elevation of 125 ft, a field 500 x 1,200 ft. There is a large hangar on the southwest corner. Runways northwest and southeast 1,500 ft long, with surface smooth, and usable throughout the year.

4—Also at Culver City Frank Baker Aircraft maintains a field 600 x 4000 ft with north and south runway 4000 ft and east-west 2500 ft. Surface good.

5—Landing Air Lines maintains a field 500 x 2,500 ft at Culver City. Runways east-west are 2500 ft long, with a surface good but with an wet weather.

6—Pacific Air Transport has an improved 500 x 2,500 ft field six miles southeast of Los Angeles, with 2500 ft runways east-west. Surface good throughout year.

7—Rogers Airport measures 1000 x 1,000 ft and is located east of Culver City, near Los Angeles. Runways extend northwest and southeast.

8—Curtis maintains a support 51-2 miles north with 2500 ft runway north and south, and a 700 ft runway east-west. The field measures 2500 x 3000 ft.

9—Ingwood maintains a port 500x1000 ft, eight miles south of Los Angeles on East South Western Avenue. Here the surface is slightly rolling, but good throughout the year. Complete service at all times.

10—Ingwood also maintains the miles south of Los Angeles a field with a 1000 ft. rolled and oiled runway. Four-way hangars good throughout year.

11—Kelly Airport also at Ingwood offers a 1200 ft east-west runway. The surface is smooth but easily in wet weather.

12—Los Angeles Airways, Inc., maintains a field 655 by 4000 ft 6 1/2 mi. south of the center of Los Angeles.

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East-west runways measure 600 ft., surface being grass in all weather.
12—Dyer airport 1½ mi. north of Modesto measures 2600 x 1900 ft., with a runway east and west. This is five miles from the Pacific Ocean. Mechanical service is available in the field.

San Francisco has two important ports, Mills and Colma fields. Mills has a size of 8800 x 1400 ft. elevation sea level. This is 13 mi. south of San Francisco on the edge of the bay, and is municipally owned and controlled. The following should be noted.

Standard markings—100 ft. white circle, four tangents, 40,000 sq. ft., same painted on hangar roof. All buildings and roads painted white. Flashing rotary beacons on hangars. Flood lights for night flying. Wind direction indicator on hangar No. 2 illuminated. Power lines west of field and all buildings on field marked by red obstruction lights. White boundary lights entire circuit of field. Green lights make corners of runways.

Three runways—(1) 3700 x 200 ft.; (2) 3800 x 200 ft.; (3) emergency runway across highway 1800 x 250 ft. Surface on all runways excellent. Completely equipped administration building and hospital. Restaurant. Mechanical service. Weather bureau representative located here for survey of meteorological and aerological conditions on San Francisco peninsula.

Crissy field measures 3000 x 500 ft. at an elevation of eight feet. It is located on the north face of the San Francisco peninsula, by a large cliff. Hangars on extreme west and south edges of field, better marked "Crissy Field." West corner on coast guard buildings on north side. One-fourth mile west of Palace of Fine Arts



for view of Oakland municipal airport, Oakland, as it will look when projects now under development are completed. Art work on this picture has been done in scale on aerial "shot" of the field.

building of old Exposition ground. Landing and flood lights on headquarters building, south side. Runways 500 ft. east-west. Ground well under all conditions. This field is available only as an emergency field for other than government planes.

Conditions of airports in the smaller cities approximate those of airports in other cities. While loyal Californians believe the airport situation there to be better than elsewhere, development throughout the United States necessarily is increasingly satisfactory. One reason for an increasing number of municipal ports in California may be noted in the legal situation. A California statute (1927, page 485) provides that airports may be established under municipal ownership and control. Fortunately, and this is particularly important, cities may acquire land even outside their political boundaries and exercise the necessary

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control over it. The statute also provides that existing park or other municipal lands may be devoted to this use, and establishment of airports is declared by the legislature to be a park purpose.

In an opinion prepared recently by Louis T. David, deputy city attorney of Palo Alto, at a time when the Board of Public Safety was hearing protests concerning a school of aviation, he pointed out incidentally that the city is given power to purchase, provide, erect and locate all necessary structures and appliances either within or without the city. Taxes may be levied and bonds issued to raise the necessary funds for the acquisition of an airport, and its equipment and taxes may be levied for its maintenance. All bonds must pass to the effective date of the act (July 29, 1927) are validated, provided the bonds were passed by the necessary two-thirds vote and sold at par.

"It is significant that this act," Mr. David pointed out, "in giving certain control of airports to municipalities does not give them the power to regulate flight except over the airport itself, although it does provide that the city may collect tolls, may sub-lease the airport and may control the coming and going of passengers and freight, and may employ pilots."

City May Regulate Airport Location.

Another California act known as Acquisition and Improvement (Missions) Act of 1925, also contains a clause concerning airports. This does not lay down rules to regulate such municipal properties, however. In taking over property outside its political boundaries, in California a city has power to regulate the use of the property. Within the corporate limits of a California city, no doubt is proper for the city to be asked so as to regulate the location of an airport, and also to regulate commercial aeronauts to that extent. This of course would affect both intra-state and inter-state commerce, though the Department of Commerce has full power to lay down rules affecting inter-state commerce.

"When an airport is located within the city limits," Mr. David also pointed out, "the structure of the necessary structures, hangars, etc., is naturally subject to local building regulations. The aesthetic appearance of these structures alone, either within or without municipal territory, is not directly subject to regulations by the city. While the aesthetics of particular locations may be protected incidentally through the operation of a zoning ordinance, officers to right are not in law a nuisance excepted with other conditions."

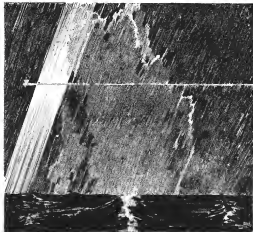
With reference to traffic entering and leaving airports, it has been repeatedly held by the California Supreme Court that the regulation of traffic is a state and not a municipal matter, and that municipalities have no power to legislate upon the subject of traffic regulation except in those details where the state has not acted.

Regulation of aircraft has been passed by California as vehicular traffic, and of course it is apparent that this is especially applicable as a subject of state regulation because of the great mobility of aircraft.

There have been some attempts on the part of citizens residing near airports in California to have them closed as nuisances. It may be interesting to note that equity as contrasted with positive law, provides a class of principles (found in reported decisions where principles may be applicable to nuisances arising from the maintenance of airports). Here it must be borne in mind that the term "nuisance" under the law does not include or comprehend a class of acts or conduct as is commonly thought by laymen. Thus it is held in California that mere fear that an airplane may fall, is not of itself a

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pany was the first contract mail route in America to make money. It is said to be one of the most profitable of those opened today. Its success led it to acquire an established route carrying mail between Cheyenne and Pueblo through Denver. This service has grown steadily in popularity. It is operated with Whitehead-engineered Stearns airplanes. On both these routes passengers, mail and express are carried.

Early this year, the Government paid for the Provision of Airmail and selected Western Air Express to operate what was designated as the world's model airmail, laid out between Los Angeles on the south and San Francisco and Oakland on the north. One plane a day is flown over this route, carrying passengers and express.

Three Engines Fokker Monoplanes Used

The planes are tri-engined Fokker monoplanes having accommodations for twelve passengers. Two pilots are carried. The planes are the largest and most powerful commercial aircraft operated in America today and are equipped with every comfort for passengers. They make the 300 mi. run in three hours or less. Remarkable advances in schedule has been developed.

Lately Western Air Express absorbed Pacific Marine Airways, which for years has operated a seaplane service between Wilmington, near Los Angeles, and Oakland, on California Island. It is anticipated that the parent company will buy more planes for this line and improve its service materially. The concern also operates a sight-seeing service over Los Angeles in an eight-passenger tri-engined Fokker monoplane.

The West has had since the first, one of the largest of the country's air mail routes—that between Los Angeles and Seattle. This service is held by Pacific Air Transport, a company originally formed by Varco Goss, a former Oregon operator of airmail stages who admits he has been fascinated by aviation ever since he saw an



The new 12-passenger Boeing transport is in use on the S.A.T. Sea Port route-Chicago line.

airplane in flight. Late last year control of this concern was obtained by Boeing Air Transport and since that time its operations have been greatly reorganized. It carries mail, passengers and express over the 1,000 mi. stretch in approximately thirteen hours including all stops. The line has been a financial success for many months. Originally Ryan sailplanes, Travel Air biplanes, two Fokker Universal monoplanes, two Boeings and a Waco were flown. The first Travel Air monoplane, that in which Ernest Smith and Emory Bennett flew to Hawaii, also was flown by this line for a time. Since the reorganization, however, Boeing cabin biplanes, with accommodations for four passengers, have been put in service. Another of the original group of contract air mail lines,

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the second such route to show a profit, is that from Salt Lake City to Pasco, Wash., operated by Walter T. Varney. This line was sold out by the postal authorities to run from Elko, Nev., where connection was made with the trans-continental route, north and west through Boise to Pasco, where the mail was put aboard trains for Portland, Spokane and Seattle. Varney, however, to obtain better flying conditions, obtained a change to Salt Lake as a terminal. The route is flown with Stearman and Sperryman biplanes, both powered with the Waco-Waco. No passengers are carried.

Latest to join the list of contract air mail routes is National Paris Airways, operating north from Salt Lake City to Reno and Great Falls, Montana. This route serves a full day by covering the 500 mi. distance in two hours and brings Great Falls, formerly one of the most difficultly accessible points in the United States, within 32 hr. of New York. Passengers as well as mail are carried. Bolder Super-Universal monoplane, powered with the



Paght picture of a Ford tri-motor flown by Mulholland Air Lines

same type of "Waco" engine used on the Boeing and Pacific Air Transport lines, are used. These provide accommodations for six passengers. The new line begins operations August 8 and has every prospect of a heavy patronage.

There is one other mail route in the west worthy of special mention—that between Seattle and Tacoma, B. C. Although the schedule of this line is variable, since it is used solely to expedite delivery or dispatch of foreign mails and strictly conforms to steamship schedule, it is important as the first air mail line to be handled by private contract in America. Edward P. Rydholm, now vice-president in charge of operations for Boeing Air Transport, was the original contractor. It has since been taken over by Northwest Air Service, a company formed by Curt especially to bid on this contract. Originally only a mail line, it now carries passengers as well. It is flown with a Boeing biplane.

The regularity of this line's service, its freedom from accident and the great saving of time it effects, enabling foreign mails to reach departing vessels a day after they leave Seattle, on occasion, has brought it considerable attention.

Of strictly passenger lines operating on daily schedule the West has two, while several others are being developed and two more by a third-airwork schedule. The daily-schedule operators are the Western Air Express and the Pacific Northwest Airways, both of which are mentioned in the San Diego-San

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Franchise line of Maddux Airline, a Los Angeles concern.

The Los Angeles-San Diego sector of this line has been operating since last November; the northern sector was added in May of this year. This route operates Fleet tri-motor all-metal monoplanes and has been well patronized, both by business men and by tourists who desire to



A "Whitcomb Seafarer" used on the Farway line, Paris to Salt Lake City.

see the country. The through run is accomplished in about five hours. Intermediate stops are made at Bakersfield and Fresno on a section and at Los Angeles regularly. Extensions of this service to Dallas, Texas, are in prospect, according to plans of the company announced some time ago.

The three-week service are those of the Aero Corporation of California, from Los Angeles to Tucson and of the West Coast Air Transport Co., from San Francisco to Portland and Seattle.

The Aero Corporation line was placed on regular schedule Nov. 28, 1927. This line uses Pottier Universal planes and has developed considerable traffic. Indeed, it was the increased patronage given an irregularly-scheduled line which led to the establishment of the three-week schedule.

The West Coast line utilizes Bush Air Yachts. Its service, too, has been well patronized and there are various rumors current as to extensions of service soon to be made. The tri-motor feature of these planes has proved an important feature in attracting business, while the striking nature of the scenery along the route has induced a number of tourists and sight-seers to travel over it by air.

Airports in the State of Washington

(Continued from page 698)

Boeing Field, however, has not been Seattle's only air development. The last Congress made available \$400,000 for beginning extensive work at the Sand Point Naval Air Base, situated eight miles northwest of the Seattle post-office. A total of more than \$5,000,000 has been authorized for hangars, railway construction, barracks and other improvements. The base will be the equal of any in the United States. Situated on Lake Washington, it is suited for use of either land or sea planes, and is planned as the great support for the Navy in the Northwest.

Ryan Mower Field, Seattle, one mile southeast of the city limits and near Rainier, is a good permanent field. There is a sea plane harbor at Madison Park, on the west side of Lake Washington, four miles from the center of

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AVIATION

September 3, 1929

the city. A temporary field is located five miles north of the Seattle post office and just north of the Boeing Airplane Co. plant.

Development of air service has been coming with a rush in the Pacific Northwest, as landing fields have been established. Two lines operate daily service down the Pacific Coast to San Francisco and Los Angeles. They are the West Coast Air Transport and the Pacific Air Transport, Inc. The Boeing Company recently purchased a controlling interest in the Pacific Air Transport, Inc. The Seattle Columbia Airways, Ltd., maintains service of one trip a day between Seattle and Victoria, B. C., and Victoria and Vancouver, B. C. The Varney lines, with Seattle offices, operates on an air mail route between Puget, Washington, and Salt Lake City.

Seattle has great possibilities as well for flying boats and seaplanes. A service with a knapsack on Lake Union, in the heart of the city, operates a flying boat flying boat which carries mail and passengers between Seattle and Victoria, B. C., speeding up trans-Pacific mail schedules.

Several other airplane services are contemplated at the present time between Seattle and other Pacific Coast points. A tourist airplane service, by which passengers are flown around Mount Rainier, is in operation.

But while Seattle has been active, other cities of Washington have not been idle. A number of cities have excellent permanent airports. There is scarcely a town of any size which does not have at least a temporary field. Aberdeen and Hoquiam have a permanent field, as has Chehalis. Chelan, Cle Elum and Colfax have temporary fields.

Everett has a very good permanent field. Port Lewis offers an excellent field. Edmonds and Harrington have temporary fields. Kettle Falls has a permanent one. La Grange has an emergency field. Longview and Newport have temporary fields, as has Okanogan. There is a small emergency field at Wallingford. Olympia and Buxton have very good permanent airports. Patuxent and Republic have permanent fields. Quincy has a temporary landing field, fully equipped. Tumwater has its excellent airport. There are permanent fields at Shelton, and Spokane Falls field, Spokane, is excellent. Tiroso has a permanent field. Tonawanda has a temporary one. Vancouver, Walla Walla, Yakima and Wenatchee, all have permanent fields, which are very good. Wiley has a small field.

Washington is therefore becoming linked more closely by air routes week by week. The general plan is beginning to make its appearance in the territory, in addition to the permanent machines flying on established routes and by schedule. It is not beyond the bounds of reason to expect that individually owned planes will be in as common as were automobiles only a few years ago.

Airport Development in Oregon

(Continued from page 657)

ago it had one quail field, the multimillion airport of the Harbison Flying Service. Swan Island was under development to become the Port of Portland Airport. Now the latter field has been awarded Department of Commerce Class AAA rating. Basking is developing a new field which will be of Class AAAA proportions, and two other large commercial fields are in use.

The government has 20 actual fields in Oregon, as follows: Albany, municipal; Camden, municipal; Corvallis, municipal; The Dalles, fair grounds, municipal; Eugene, municipal; Forest Grove, commercial; Grants Pass, mu-

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melaj, Klamath Falls, commercial; Lakeview, municipal; Medford, municipal; Milford-Pleasant, auxiliary; Portland, auxiliary; Portland, Burkin and Swiss Island; Prineville, auxiliary; Roseburg, municipal; St Helens, auxiliary; Salem, fair grounds and commercial (two fields); Silverton, municipal.

Add 19 New Airports to Government List

In the report of the aeronautics committee to the State American Legion convention last July, Sully V. Hall, Medford representative of the Seattle Air Transport Co., and Legion aeronautics chairman, added 19 names to the government airport list. These cities, the report said, had either established municipal fields or were contracting them: Junction City, Marshfield, Rose, Elgin, Cottage Grove, Ashland, Redmond, Osnage, La Grande, Baker, Maizeville, Burns, Vernalis, Hood River, Newport, Shastat, Merier, Astoria and Ben.

The Cottage Grove field is a development of one of the seven government fields now being built for military purposes along the Pacific coast airway in Oregon. It lies on the divide between the Willamette and Umpqua river watersheds, about 25 mi south of Eugene. The other one issued by the Department of Commerce is Glendale, in the Cow Creek canyon, east of the roughest sections between Portland and San Francisco, Leland and Myrtle Creek, also in mountainous country, Yreka, midway between Cottage Grove and Roseburg; Woodburn, north of Salem, and Scappoose, between Portland and Longview, Wash.

Then, added to the foregoing three lists are the following cities: Bendon, Heyburn, Hillsboro, Wallersee (an auxiliary airport at the Crow Creek district) and Seaside. Not all of these 19 airports are ready for use. Some

require clearing. Many are without runways. Not all are marked. Nothing has been done to keep the government issued fields except that at Cottage Grove. They will be developed to the point necessary for emergency use in connection with the lighting of the Seattle-San Francisco airway now in progress.

But all of these fields, the government now includes, are to be ready for general use by the first of next year. Not all of the fields have hangar space, or shops, as yet, but the programs in all of the larger places call for that construction as soon as possible. Lighting of fields is also part of all regular programs.

S. S. Rogers, airways extension superintendent for the Department of Commerce, is now at work surveying the Seattle-San Francisco airway for lighting, the entire job to be completed this year. Part of this program calls for the establishment of emergency fields by the Government where municipal or private interests have not already located them within 25 mi of each other. Emergency fields will be clear in mountainous country. More such fields will probably be located in the northern part of the State, along the coast airway, but the northern section would seem to be fully equipped with airports now.

Portland Field Largest in State

The plans vary in size from about 40 acres to the 250-acre potential area of the Port of Portland airport. About half of this field is now in use. In a recent article in *Aeronautics* this field was treated as typical. It is, naturally, the most pretentious in the State. The airport was made by building up Swan Island both in altitude and in area with dredgings from the Willamette river ship channel. A runway 350 ft. wide was also constructed, con-



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meeting the island with the mainland. A smooth, oil-standard road now crosses this causeway.

One runway, 2200 ft. long and 100 ft. wide, has been constructed of oil-clay-concrete. This single division was considered all that was necessary because it parallels the prevailing winds and the island gets almost no cross wind. The remainder of the 100 mile area, except for hangar and road space, is seeded for grass. The part of the island unsuitable for use yet is being topped with a layer of clay, pumped from the channel. This will also be seeded.

The first plant on the island consists of three good-sized hangars. Two of these are practically complete. One is designed to house four 25-footers Bush cabin monoplane of 55-hp. wingspan, operated on the Portland-Seaside and Portland-San Francisco runs of the West Coast Air Transport company. The second is planned to cover three 50-ft. span Boeing planes for the Pacific



J. G. Tomlinson, head of the Pacific Flying Service of Portland, and Oregon's best known pilot.

Air Transport Co. The third will have three stalls for various type planes of the Macdonald-Morrow Aviation Co. Besides these smaller hangars of the Bush type, designed by Carv Bendy of the Port of Portland engineering staff, will be set up for small purposes. They will be built as needed. The large hangars are of corrugated iron construction and each contains shops.

An administration building is planned for early construction. Three of companies are installing underground conduit lighting systems with central pumping stations, each allowing servicing of planes at three widely separated points on the field without tracking. These main companies are expected to follow suit.

Lighting of the field has not been started. James H. Polhemus, general manager of the Port of Portland, promises that the equipment will be of the most approved design when needed.

Back top-pavement has been laid in three of the hangars built so far. It extends out to the edge of the field, meeting the hangar way of access to planes. The West Coast passenger planes now right up to the Company's office, within a few feet of the road.

The United States Weather Bureau has established an upper air observation station on the island. One was already in operation at Molokai.

The new field of the Pacific Flying Service is in the north edge of the city. It has an area of more than 100 acres. It will have three principal runways, one east-west, 3,000 ft. long, one south-north, 4,500 ft. long, and one



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pany recently learned to exploit the instruction curriculum used in the school, in marking its system all over the country.

As yet Oregon has not entered the manufacturing field commercially, except in the case of spruce. Most of the spruce used in airplane construction has always come from Oregon and Washington. However, sea firm is now perfecting an airplane engine of new design, and it is known that announcements of four airplane manufacturing plants are to be made shortly. Oregon is a State of great distances, as the number of transoceanics shows. This fact is proving a stimulus to flying.

Clubs and Schools in
Southern California

(Continued from page 696)

California thus forming a large group of affiliated small clubs that will economically serve a wide area and many young men who are eager to work into aviation. A transport pilot has been engaged and will continue his schedule as shall he may travel from town to town making regular instruction visits to all organized fliers.

In considering the established private flying schools it is impossible to go into detail on even the more important of these because of the great number of such organizations.

Numbering only Southern California flying schools that are known to be successfully operating as a large scale we have in Los Angeles, Rogers Airport, American Aircraft Corp., Lincoln Air Lines, Los Angeles Airways, Barden's Airport, Aero Corporation of California, Dyer's Airport, Southwest Airways, Sherr's Airport, California Airways, Calif's Airways, Bader Airport, California Aerial Transport, and the Warren School of Aeronautics and



Showing a section of the shop at Pacific Technical University, affiliated with Ryan Flying School.

Western College of Aeronautics which operate both ground and flying schools; Ventura Airport, Ventura; Cheddierno-Denzer Air Service, Santa Barbara; General Aircraft, and Wilson Flying School, Glendale; Bible Martin's Airport, Santa Ana; Compton Airport, Compton; Kelly Field, Inglewood; various active flying schools at both the Long Beach Municipal Airport and at Clearfield, Santa Monica; and The T. C. Ryan Flying School and San Diego Air Service, at San Diego. All of these schools employ experienced pilots of high reputation.

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The Western College of Aeronautics and the Warren School of Aeronautics operate both ground and flying schools, but specialize in the ground work which is most complete. Special courses in instruments and navigation are offered at the Warren School under the direction of Lieut. Comdr. Clarence S. Williams. A comprehensive study of mechanical engineering at the Western College of Aeronautics is carried on under William J. Waterhouse.

Several of the more successful large flying schools have developed special work in connection with the flight training. The American Aircraft Corp., Western distributor of Waco airplanes has graduated 182 students of flying during the past two years. From five to nine Waco biplanes are always on the line ready for student instruction. Three pilots, a wing and rigging expert and an engine man are employed in the school work. Regular



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lectures for the students are carried on, Theodore T. Hall, president of the American Aircraft Corp., teaching Aerial Law, and Miss Helen Jett, secretary, giving a course in road finding and cost analysis for men who expect to enter the work of airport operations. Classes in airport construction and maintenance are also conducted; grading work being done with a caterpillar tractor, and overhaul of field landing and boundary lights being regularly performed.

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BIRCH Thicknesses of the thoroughly rugged from 1/16" to 3/16", varying in price from 10¢ per sq. ft. for the 1/16" thickness to 40¢, per sq. ft. for the 3/16" thickness. Thicknesses of 1/8", 5/16", 1/2", 5/8", 3/4", 1", 1 1/4", 1 1/2", 1 3/4", 2", 2 1/2", 3", 3 1/2", 4", 4 1/2", 5", 5 1/2", 6", 6 1/2", 7", 7 1/2", 8", 8 1/2", 9", 9 1/2", 10", 11", 12", 13", 14", 15", 16", 17", 18", 19", 20", 21", 22", 23", 24", 25", 26", 27", 28", 29", 30", 31", 32", 33", 34", 35", 36", 37", 38", 39", 40", 41", 42", 43", 44", 45", 46", 47", 48", 49", 50", 51", 52", 53", 54", 55", 56", 57", 58", 59", 60", 61", 62", 63", 64", 65", 66", 67", 68", 69", 70", 71", 72", 73", 74", 75", 76", 77", 78", 79", 80", 81", 82", 83", 84", 85", 86", 87", 88", 89", 90", 91", 92", 93", 94", 95", 96", 97", 98", 99", 100", 101", 102", 103", 104", 105", 106", 107", 108", 109", 110", 111", 112", 113", 114", 115", 116", 117", 118", 119", 120", 121", 122", 123", 124", 125", 126", 127", 128", 129", 130", 131", 132", 133", 134", 135", 136", 137", 138", 139", 140", 141", 142", 143", 144", 145", 146", 147", 148", 149", 150", 151", 152", 153", 154", 155", 156", 157", 158", 159", 160", 161", 162", 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993", 994", 995", 996", 997", 998", 999, 1000**MAHOGANY** Thicknesses from 1/16" to 3/16" to 2 1/2" in thickness at 40¢, per sq. ft. for the 1/16" thickness to 40¢, per sq. ft. for the 3/16" thickness. Thicknesses of 1/8", 5/16", 1/2", 5/8", 3/4", 1", 1 1/4", 1 1/2", 1 3/4", 2", 2 1/2", 3", 3 1/2", 4", 4 1/2", 5", 5 1/2", 6", 6 1/2", 7", 7 1/2", 8", 8 1/2", 9", 9 1/2", 10", 11", 12", 13", 14", 15", 16", 17", 18", 19", 20", 21", 22", 23", 24", 25", 26", 27", 28", 29", 30", 31", 32", 33", 34", 35", 36", 37", 38", 39", 40", 41", 42", 43", 44", 45", 46", 47", 48", 49", 50", 51", 52", 53", 54", 55", 56", 57", 58", 59", 60", 61", 62", 63", 64", 65", 66", 67", 68", 69", 70", 71", 72", 73", 74", 75", 76", 77", 78", 79", 80", 81", 82", 83", 84", 85", 86", 87", 88", 89", 90", 91", 92", 93", 94", 95", 96", 97", 98", 99", 100", 101", 102", 103", 104", 105", 106", 107", 108", 109", 110", 111", 112", 113", 114", 115", 116", 117", 118", 119", 120", 121", 122", 123", 124", 125", 126", 127", 128", 129", 130", 131", 132", 133", 134", 135", 136", 137", 138", 139", 140", 141", 142", 143", 144", 145", 146", 147", 148", 149", 150", 151", 152", 153", 154", 155", 156", 157", 158", 159", 160", 161", 162", 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OF-4 Engine Mounts, 30

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PLEASE READ FOR MODERN AVIATION

SIDE SLIPS

By ROBERT R. OSBORN

At the flying fields near New York city there have been a number of accidents recently to cars and to small airplanes by taking them for a short ride in the air. As the cars seem to rest on the runway during the start, several small airplanes which are trying to stop the cars, and together there is a bit of a run around. We can't offer any testimony of what is being done in this fashion, but we do know of one man who has done for him riding than he did before such a flight.

That man who has been in the air of a big New York plane, and frequently has been the reporter assigned to the Long Island Sound, has been in the air in very thick weather, which flights were not to the airport's floor. The editor finally visited one field to take a flight, and the pilot was quietly requested by the reporter to "shoot the works." The pilot did a few afternoon's work, and before landing released thoroughly of all the tricks he knew and added a couple to his repertoire. As the editor got out of the plane after landing, three photographers took about 10 photos each, showing him in various stages of economy from his flight. These pictures were shown to the editor the next day who was informed there were about a hundred prints available for distribution if he cared for showing them around should arise. The reporter hasn't heard a word from him since.

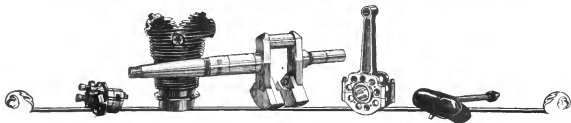
The Imperial Aviator visited on the other day, having just come from a cross country trip in a new ship, during which flight he experienced some forced landings because of breakdown and stopped in the gasoline pump system. He claims this ship is probably the "best piece" airplane he has landed so much about.

The newspaper stories of the existence of Commander Byrd's last ship for the trip to the South Pole are very interesting. The story is the cargo which seems to be missing the most constant is the ice cream freezer, which everyone thinks would be about as useful at the South Pole as a couple of gals hot lips. There have been many comments about the selection of loads which are long takes along, and we'd like to send down a couple of complete references, so to be taken down and left there. Our entire mistake we think is being made in that any member of the crew who can play a musical instrument, or who claims he can play one, is being allowed to take it along. A perfect setting for a mariner, say dear Watson, a perfect setting.

According to the description of this ship, the 10 men in the crew, not including the officers, have their beds built in the walls of the recreation room, where sufficient for card games and other amusements are provided. Also these men are not allowed to carry more than one rubber ball of clothing each, because of the demand for space. With as many as this we prophesy that the 10 valves and compass will be owned by one man for most of the trip.

The writer of the New York Evening Post's description of the ship "The captain's room (they still call him captain, although he was made a lieutenant commander in the Navy Reserve last week)—"We

There is *NO* Most important part of a WRIGHT ENGINE



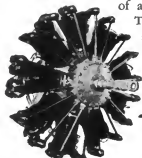
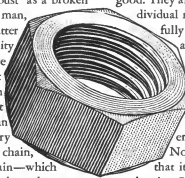
"THIS little rocker arm", said a Wright workman, "could cause as big a 'bust' as a broken master rod". The attitude of this man, his realization that his job, no matter how small, involves a responsibility as important as that for the entire engine, is typically Wright. That is what is meant by the expression "Wright engines have no most important part". Every workman throughout the Wright factory knows he is forging one link in a chain, and that the strength of that chain—which perhaps must span an ocean—is dependent upon the link he makes.

Every part—however small—is made with the same care as every other part. The steel for a tiny nut or bolt is heat-treated, machined, inspected, tested and retested with the same scrutiny, the same vigilant alertness, the same refusal to pass anything but perfection, as characterizes the making of a large connecting rod.

This knowledge of responsibility, permeating every individual workman in the

Wright factory, is what makes Wright engines good. They are designed right, made by special individual method in every tiny part; built carefully and slowly by men who know they are making an unusual product...one on whose performance the eyes of the world may rest at any moment. Never has this spirit faded. The day Lindbergh landed in Paris behind his Whirlwind Engine, the Wright operating force paraded through town. No man was their leader: each man felt that it was the perfection of his work that made the Lindbergh achievement possible. Lindbergh's engine was *their* engine.

There is "no most important part" in a Wright engine. Each part carries the full responsibility of performance, because failure in any part is failure in the whole...For more than a decade Wright has been building engines with just such care as this...to produce aircraft power plants that measure up to the highest standard of excellence...an unchanging policy which explains Wright engine performance.



Wright "Cyclone"
Aeronautical
Engine



Wright "Whirlwind"
Aeronautical
Engine

*They say
More Pilots fly them!*

WRIGHT

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